

# *Practical Psychology*







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TORONTO

# *Practical Psychology*

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## PREFACE

This book was conceived in the days of troubled peace just prior to the outbreak of war in Europe. It developed through the months of our own nonbelligerency and is being published after more than two years of participation in a total war. During that period American life has changed more rapidly than in any comparable time in history. The college student of 1940 has been replaced by the military cadet; large numbers of women have entered occupations formerly reserved for men; home life has been altered by rationing regulations; new industries have been born and others buried. Throughout this period, psychology has likewise changed rapidly. Many psychologists have left their laboratories of "pure" science to enter the armed services, adapting their professional skills to the needs of the hour. Others who have remained in civilian life have cooperated in countless ways to apply their training and information to the problems of winning a global war. This concatenation of circumstances has resulted in a transformation of the field of applied psychology.

However, looking from close range at the events of the past few years, one is impressed not only by the surface changes but by the stability of many fundamental principles. The procedures and techniques of research in the field of psychology have not changed. The mechanism of adjustment, the drives of human conduct, the principles of learning, the basic conflicts, the fundamental desires of men have remained surprisingly stable. If such were not true, a book on applied psychology would be out of date before it appeared. If this book has a peacetime tone, it is only because the illustrative applications of the basic principles have largely come from civilian life, which we hope will shortly again be dominant over our present military activities.

The aim throughout this text has been to survey the chief problems in which the applied psychologist has made some contribution. The attempt has been made to present sufficient background

information for the reader to understand first, the significance of the problem, and second, the broad principles upon which the psychologist's contribution is based. The experimental studies summarized in the text have been selected largely because of the degree to which they represented "field" as contrasted with "laboratory" research, even though a field study may only verify a conclusion previously established more accurately in a laboratory. This procedure has been taken with two convictions: First, that many previous texts in this field have lacked a realistic tone because of their emphasis upon pedantic-appearing laboratory investigations; and second, that the student and layman are more readily convinced of many propositions by reference to studies made outside the highly controlled conditions of academic laboratories. Furthermore, no effort has been made to present a comprehensive summary of all the studies bearing on a given topic. Such a summary is the proper function of a handbook, not a textbook. Again, the layman and student, from my observations, are interested first in conclusions and second in the evidence and procedures upon which those conclusions are developed. From these comments it is quite clear that the book has been written for people with little or no previous contact with the usual elementary psychology course. Those who have had this background will find in the present text much that is new and little that duplicates their previous work in psychology.

The field of applied psychology is so extensive that it is virtually impossible for one individual to cover all topics within the limits of a single volume. Some selection of topics has therefore been necessary. This selection has been governed by two considerations: first, the amount of useful information available to the author, and second, the interest displayed by students concerning certain topics. Unfortunately, these two considerations were not always in agreement. Specifically, Chap. II has been included largely because experimental evidence on learning is plentiful, while Chap. XIX exists principally because of student interest. The discerning reader may also notice at various points throughout the text that attention has been drawn to important gaps in the scientific literature. In some cases these gaps have been filled in by hypotheses that seem reasonable—at least to the author.

I am indebted to the numerous publishers and authors whose works are referred to throughout the following pages. To the students who have called attention to the sections that were obscure, of little interest, or too labored I am obligated. Finally, I am grateful for the suggestions made by two of my colleagues, Dr. C. W. Young, Associate Professor of Psychology, and Dr. G. E. Schlessler, Assistant Professor of Education, both of whom read sections of the typescript.

F. K. B.



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I. PSYCHOLOGY APPLIED  
*to Education*



# Chapter 1

## STUDY EFFICIENCY

It is appropriate that a course in applied psychology should be introduced with a discussion of the psychological principles of study. All too frequently college and university students finish twelve or more years of schooling without stumbling upon the easier ways of achieving scholastic success. Many, of course, discover artful dodges that barely satisfy requirements, but few find the ways to real achievement that entail a minimum of effort. Efficient study enables the student to complete his assignments in a short time with a high degree of success, permitting greater time for extracurricular activities, exploratory reading, or relaxation. It is often unnecessary to study longer to improve one's scholarship if, instead, the allotted time is used more efficiently.

Success in scholarship, like success in business, industry, teaching, the law, medicine, or any other field of work, often turns on the effective use of the twenty-four hours per day that every person has at his disposal. A person of average capacity who uses his time well may often surpass in successful achievements a more capable but less efficient individual.

It will be the purpose of the next few pages to point out techniques and procedures that have demonstrated their effectiveness not in serving as shortcuts to transitory success, but rather in getting the greatest returns from the effort and time expended.

Great individual differences in susceptibility to the factors that, in general, detract from efficient work will be found in any group of students. In making the recommendations that follow we have been forced to think of the hypothetical average college student. Not all suggestions will apply to any particular case. Some students with outstanding records will discover they employ study habits that for the majority are markedly deleterious. To change some of

these habits would probably require greater effort than the benefits would warrant. On the other hand, the student of mediocre accomplishment may check his own study procedures against the suggestions that follow and make readjustments accordingly.

### 1. MOTIVATION

Strong motivation is necessary for efficient study. That is to say, some compelling, persisting desire, satisfied by academic activities, is a prerequisite condition. The importance of motivation in efficient study is emphasized by many investigations. For example, one small group of students who left college because they lacked interest in their studies returned some months later with new and stronger drives. Their scholarship improved more than 96 per cent, an increase ten times greater than the best average improvement shown from year to year by students not interrupting their college course.<sup>1\*</sup> Just as diluted weak gasoline prevents an automobile from delivering its utmost power in emergencies, so weak motives may cause a person to flag, hesitate, or halt in the face of minor obstacles. The prerequisite to superior attainment—scholastic or otherwise—is strong motivation.

What are the motives of college students? What are their reasons for study? What longings, desires, wants, urges, are satisfied by academic work? How can legitimate motives be generated and strengthened?

Some students say they come to college to please their parents; others to gain a "background"—social approval; others want vocational training; still others find in academic work a satisfaction that is inextricably intertwined with the work itself; some want Phi Beta Kappa keys, grades, prizes, and the approval of the instructors which such rewards usually bring. For the vast majority of students a complete statement would include not just one but several of these motives. Are they all equally effective? Are they all equally healthy from a mental hygiene standpoint?

#### *Primary vs. Secondary Motives*

For purposes of discussion at this point motives may be divided into two classes: primary and secondary motives. The

<sup>\*</sup>References to which numbers refer will be found at the end of Appendix.

first are those that are satisfied by rewards inherent in, or very closely dependent upon the motivated behavior. The secondary motives are those that are satisfied by factors that are remotely related to the motivated conduct. To illustrate: What are the motives for attending a concert? Usually people go to concerts to enjoy the music. The satisfaction of that motive is inherent in the activity of listening to the music, watching the conductor or musicians. Such a motive is a primary one. Other people may attend concerts simply in order to be seen in fine clothes or in the "proper society." For them the music and musicians may be boring, uninteresting, to be tolerated and paid for to satisfy a desire unrelated to the music itself. Still others may get their satisfaction in telling their less fortunate associates of hearing Rodzinski "do" Mozart's Fifth. The latter instances illustrate the secondary motives by which satisfactions are derived from and not inherent in the motivated activity.

Sometimes it may be difficult to decide how a particular motive ought to be classified. In spite of this fact, there is no doubt that motives high in primary qualities are preferred to those lacking these qualities.

Common parlance dubs people hypocrites whose actions are generally governed by secondary motives. The psychologist prefers to withhold names and points to the unhealthy mental attitude. The danger in secondary motives lies in the fact that the satisfactions, being extrinsic to the activity, may not always follow. The result is frequently a frustrated, discouraged, unstable individual. An example may clarify this point.

Bert was considerably above the average college student in intelligence. He could expect some financial help from home but preferred to be independent, earning almost all of his college expenses. What he wanted most, however, was a Phi Beta Kappa key. He spent long hours at the post office, clerking in a store, and on his class assignments. For three years he hammered away persistently at the goal he had set for himself. Well liked by students and faculty who knew him, he enjoyed a reputation of being earnest, sincere, ambitious. During the summer following his junior year a change came over him. His grades were such that even with a straight A average for his last year he would miss Phi Beta Kappa by a small fraction. He started off his senior year by cutting class for nearly a



week. He began to squander his money; bought a car; took weekend trips. During Thanksgiving recess he wrecked the car in an accident that made him a defendant in a suit for damages. By the end of the semester his academic standing was precarious, largely because his alarm clock was set an hour to an hour and a half later than class time. He was dropped from college because of playing a part in an examination cribbing deal.

The motive that guided and energized this student was obviously a secondary one. He got little or no enjoyment from his work except as it brought him grades that were expected to bring him distinction. When he saw the possibilities for that distinction fade there was no point in further effort. Notice too, that the disappointment altered his outlook in general. His frugal, thrifty attitude changed so that before he left school he was in both financial and academic difficulties.

This case is not presented to discourage high scholarship. There is plenty of evidence pointing to a positive relation between high scholarship and success later in life. But what is emphasized is, first, the potential dangers in secondary motives and second, the derived nature of the "grade motive." Students will do well to look for motives in study that are primary—motives that can be satisfied by study activities themselves. It is no chance accident that efficient students find pleasure in solving a calculus problem, unscrambling a Latin sentence or comprehending an involved chemical reaction.

### *Acquiring Primary Motives*

The responsibility for acquiring primary motives rests ordinarily on the student's shoulders. Unfortunately—or perhaps fortunately—no one can do much to create primary motives in others. Exceptional teachers sometimes can make calculus romantic or can squeeze music out of early archaic English prose. These uncommon teachers have unusual success in helping students generate for themselves an enthusiastic interest in the subject matter wholly devoid of any ulterior satisfactions. But these teachers are rare. Generally speaking, the student will find himself being driven by primary motives in only those subjects that are closely related to some basic personal interest—vocational or otherwise.

What is the solution for the student who finds himself in a course with an uninspiring instructor and a subject matter that appears unrelated to any of his interests? There are three possible lines of action. First, he can escape from his problem by dropping the course. Second, he can resign himself to a boring class and drift along as best he can. Third, he can examine in some detail the range of his interests and the range of the course to discover at what point the two approach or overlap each other. The third approach might work out to his ultimate advantage, as illustrated by the following example.

The author was talking with a former student who is now employed in the personnel department of a large company. His interest in personnel work extended back over his whole college career. In school he had earned particularly poor grades in mathematics and statistics, saying he was not interested in those subjects. Now he finds himself somewhat handicapped because of his poor preparation in these skills. Until he discovered, on the job, the usefulness of statistical devices, he did not realize their relation to his basic vocational drive. Had this student examined himself more thoroughly, had he discovered the applications of his "uninteresting" subjects, he would probably have been more adequately motivated.

Personal interests and college courses, no matter how specialized they may appear at first, often reveal wide ramifications as they are pursued. One cannot go far in the study of psychology, for example, without encountering some sociology (propaganda, crime, social action), some history and philosophy (trends in theory, early writers), some economics (employment selection, industrial production, personnel), some biology and physiology (nervous system, sense organs), some physics and chemistry (demonstration apparatus, effect of drugs), some art (advertising). Even the knowledge of a foreign language is helpful in learning of the discoveries of others. In like manner an interest in sailing, if pursued diligently, may lead to the study of nautical history, the physics of gases and liquids, mathematics, meteorology, marine engineering, aerodynamics, geography, maritime law, navigation, marine biology, even the chemistry of paint and corrosion. If the student will examine his own interests and his own courses of

study, he may find numerous points of contact that will serve as motivation.

In a liberal arts college where the curriculum is constructed to give no specific vocational training, the student may at times find it difficult to relate subject matter to his specialized interests. Accordingly, a general curiosity about the nature of man's culture, his institutions, his discoveries, his machinery, his ideals, his art, and how all of these interact, may prove stimulating in a wide variety of courses. Generating such a curiosity is largely a matter of talking and associating with others who already have some enthusiasm about such matters. One of the reasons why students often find it difficult to study during vacations is that even the casual contacts with others more or less interested in academic work are missing. It is up to the student to cultivate his academic contact with teachers and students and allow himself to be infected with their enthusiasm, curiosity and intellectual inquisitiveness. Indeed, such curiosity is a mark of a broad education.

### *Some Causes of Weak Motivation*

In some cases, weak motivation comes from continued failure through an unhappy turn of circumstances producing discouragement. In others the student may fail to understand the importance of attaining subgoals. He may have a strong desire to become a lawyer but fails to appreciate the necessity for doing the day-to-day chores which represent the steps toward his ultimate objective. Often associated with this attitude is a vague belief in the efficacy of luck in producing success. "Why work hard or plug along on the daily routine when you can't be sure the breaks will be in your favor? If you happen to study the right things you get a good grade; if you don't you're out of luck." Such students ignore the fact that the bulk of the good grades go to those who know all the material under examination and not just the "lucky sample." If students will set for themselves subgoals within reach of possible attainment; if they will recognize that the students who are favored by a turn of chance are the exception rather than the rule; if, in a word, they cultivate a positive attitude toward scholastic achievement, motivation will be less of a problem.

Strong motivation is essential to efficient study; primary motives

acquired through active association with scholars and by searching one's interests and courses, are eminently desirable.

## 2. ACTION IN LEARNING

One of the basic principles which has evolved from a host of investigations into the nature of efficient learning is this: *Some action is required on the part of the learner.* Learning is not a passive soaking-up process. Instead, active aggressive manipulation of the material is essential both for rote memorizing and intelligent comprehension.

Suppose the student is faced with the task of gaining a clear understanding of a portion of Plato's *Republic*. He may be tempted merely to memorize certain key passages. This kind of rote learning requires some action even if it is only the repetition of the words. However, rote learning does not necessarily give one a clear insight into, or an understanding of, Plato's *Republic*. Students who try that method suffer from "parrot fever." A real insight can only be attained by manipulating not just the words, but the ideas. Key passages, instead of being memorized, might be restated in more modern language. Examples from one's own experience might be recalled to refute or support Plato's contentions. One might discover logical extensions of the propositions. Pertinent information from other fields might be brought into the picture.

Study other than rote memorizing means that the student must cultivate thought processes. More specifically he must search for the main idea of a paragraph, he must be able to distinguish the important from the unimportant details, he must be able to draw generalizations from a number of examples and yet guard against the ever-present temptation to overgeneralize. This last is the tendency to make broad sweeping conclusions that go far beyond available facts and ignore important exceptions to the general rule. The unwary student might, for example, erroneously conclude from the previous section that only primary motives are useful in academic work. To avoid the error of overgeneralizing and to gain the kernel of meaning requires action on the part of the learner. They necessitate more than just reading and rereading in a pious hope that after a while the ideas will "click."

A number of devices have been suggested to bring about action in learning.

### *Questions and Cards*

One very simple device is the question-and-card technique. A given assignment is first scanned for topical headings which are then converted into questions. For example, the heading to the present section might suggest, "What is meant by action in learning?" Each of these questions is entered on a small card, along with the page number. When the section is read the student then looks for the answer to his own question. Before continuing with other sections an attempt is made to frame a simple direct answer. If the attempted answer seems unsatisfactory the student knows immediately that he has missed the point and must review or reread the material. At the completion of the assignment a quick, thorough review is possible by merely shuffling the cards and running a self-test. If no answer can be given to some questions after an honest attempt, the page numbers are immediately available and answers can be found with a minimum of confusion. Moreover, a collection of such cards makes review for tests or examinations a very simple task.

The question-and-card technique has one important pitfall. It encourages students to memorize particular summary sentences, leading again to "parrot fever" without understanding. The question-and-card technique must therefore be supplemented by other devices. Anyone who reads the usual textbook carefully, in such fields as economics, physics, sociology, and the like, will find it contains two kinds of basic materials—principles or laws and illustrations of those laws. The laws or principles are usually framed carefully in terms as explicit as possible, permitting little change if the essential thought is to be retained. On the other hand, examples of these principles are only samples of the manner in which the principles operate. The author has selected them from a large number. The student can usually discover for himself similar illustrative examples and in so doing gain a clearer insight.

In addition, the student will find it helpful to devise judgment questions calling for comparison or evaluation of principles. Such questions compel one to search his personal experience or collateral

readings for evidence substantiating or contradicting the views of the author.

### *Recitation in Learning*

Another widely recommended procedure in this connection is the use of self-recitation, much as one might be called upon to do in class. The value of recitation is attested by a number of studies employing both adults and grammar-school pupils. One such investigation allowed the students only 9 minutes to study each of 5 short biographies. The manner of study however, varied from one biography to another. In one case no time was permitted for self-recitation while at the opposite extreme four-fifths of the nine minutes were spent in recitation, other biographies receiving intermediate amounts of time for reading and recitation. The students were tested immediately and four hours after the study period for their knowledge of the biography they had just covered. A similar experimental procedure was followed in testing the retention of five lists each containing sixteen nonsense syllables. The results of this study are summarized in the following table.<sup>2</sup>

Table 1. Showing Effect of Recitation on Amount Remembered

Distribution of Time	Percentage Remembered			
	Biographies		Nonsense Syllables	
	Immediately	4 Hours Later	Immediately	4 Hours Later
No recitation	35	16	35	15
1/5 recitation	37	19	50	26
2/5 recitation	41	25	54	28
3/5 recitation	42	26	57	37
4/5 recitation	42	26	74	48

It is quite evident that as the amount of time devoted to recitation increases, the benefits from the total time spent also increase, within the limits of this study. It is a convincing demonstration that recitation pays excellent dividends.

Outlining each assignment in brief condensed sentences is widely recommended, especially to failing students. When the textbook is one's personal property, underlining important statements is a convenient way of getting action into study. Writing marginal notes is another.

### *Note-Taking*

Not all learning need be confined to out-of-class work. A number of instructors doubt it, and many more students do not expect it, but occasionally in spite of adverse conditions some learning does take place within the lecture room of a college course. More would take place if students used efficient note-taking procedures. Of course, the student cannot organize a set of notes from the remarks of an instructor if the instructor has not first done some organizing. However, by and large, the fault does not lie with the instructors but rather with the listeners.

The first requisite for good notes is an inquisitive, active attitude that seeks the essential point of the remarks. Skilled instructors often give cues that help in outlining and organizing the material in a coherent form, as "Two factors operate to —"; or "In contrast, the evidence against this point of view is —"; "A second (or third, or fourth) reason for ignoring —." The attentive note-taker is on the alert for such phrases for they indicate the speaker's headings and subheadings. Other lecturers indicate the end of one point and the beginning of another by a long pause, a change in voice quality, or a shift in posture.

It is important to remember that note-taking is not an end in itself but merely a means to an end. Consequently, some find it helpful to take condensed notes in class and expand on them a short time later when the opportunity for review presents itself. Furthermore, the mechanics of note-taking should not become so laborious that one has no time to react to what the lecturer says. In other words, the efficient note-taker is not a stenographer in the sense that he merely records; he must also react, evaluate, and silently (or audibly) question statements contrary to his beliefs or understanding.

All of this assumes that the listener must be active and must participate in the lecture even though his overt actions may be quite limited.

### 3. FAVORABLE PHYSICAL CONDITIONS FOR STUDY

An important determiner of study efficiency is the immediate physical environment. A great many students fail to recognize the wasted effort and time used in overcoming distractions when

- the library steps or the dormitory lounge are used as places of study. The student who is eager to improve his efficiency will do well to surround himself at study time with those physical objects and events which forcibly suggest academic work.

Consider for a moment the condition of two desks recently observed. On Desk A was a framed picture of the student's "one and only." Tucked in a lower corner of the frame, nearly obscuring a loving autograph, was a pair of expensive theater stubs. Piled next to the photograph were three or four textbooks, one which was not in use during that semester. A couple of novels from the corner drugstore's rental library leaned lazily against the textbooks. The edge of an ancient pocket-size dictionary just showed beneath an equally small notebook. Scattered indiscriminately about a bottle of ink as the center of confusion were pencils of various sizes (only one sharpened), a letter from home, a football schedule card, two ash trays, a just-opened ream of paper, matches, thumbtacks, an assortment of keys, pennies, and shirt studs. The only redeeming feature of this desk was the semi-indirect study lamp which was correctly placed on the left.

Desk B presented a picture of order and clear-cut efficiency. Text and reference books were neatly marshalled across the back between inexpensive book ends. A small tray containing erasers, pencils, a short ruler, a box of paper clips, sat on the base of the study lamp. Blotters stood against one book end ready for instant use. Thumbtacked to the wall above the books were a calendar, and a weekly schedule of classes and other regular activities. Current magazines and light novels were placed on a neighboring window sill. Not on the desk but on the student's bureau stood the girl-friend's picture. In the only drawer of the desk were pads of ruled, sectioned, and unruled paper, a larger ruler, spare pencils, fountain pen, old letters, rubber bands, glue, and a miscellaneous collection of old papers and trinkets.

It is perfectly obvious that the student of desk A had surrounded his working space with a disorderly array of competing stimuli, only a few of which suggested continued, energetic study. If his eyes should wander from the physics problem before him to the edge of the picture frame, it is likely that for at least a fleeting moment the theater stubs would recall that taxi-dinner-dance-theater-taxi evening, with all its emotional accompaniments. Very frequently the complaint that "I just can't concentrate," can be traced to such helter-skelter desk conditions.

On the other hand, the student whose desk was B had organized



his study area not only that nonacademic stimuli would be reduced to a minimum, but that study could proceed without wasted effort. Pencils, blotters, erasers, paper, reference books, were all placed conveniently within reach so that with a minimum of effort they could be brought within his immediate working space. Here is illustrated a principle which is basic in this connection: One should make it easy to do the things he wants to do. Conversely, he should arrange his possessions so that it will be difficult to come in contact with those objects which lead him away from the main purpose of the moment.

As has already been suggested at the beginning of the chapter, some find themselves more disturbed by a neat, orderly desk than one in which familiar objects are scattered about. To these students type B desks are like a new pair of shoes—good looking but uncomfortable. If such students are not bothered by woolgathering, lack of concentration, and quick fatigue, there is little reason to alter the desk arrangements. On the other hand, if they are handicapped in these respects, a more orderly arrangement will likely reduce inattention to academic work. Concentration will probably not improve immediately since the new arrangement will be strange and unfamiliar. A period of adjustment extending over some days may be necessary before the benefits will appear.

### *Lighting*

Until recent years the principal problem of artificial lighting has been one of developing sufficient intensity. Lighting engineers now recognize the equally important problem of devising the proper quality of light for particular tasks.

Probably the best illumination for reading and other study activities is one of sufficient intensity to be comfortable, is well diffused, and does not produce marked contrasts. The reasons for laying down these very simple specifications are rather complex. To explain the reasons fully would necessitate a detailed description of the structure of the eye and how it functions. Briefly, the reasons are as follows:

Light attracts the eye. If one is staring straight ahead at a blank wall when a small beam of light appears in the edge of the visual field, the eyes and sometimes the head turn ever so slightly in the

direction of the light. The brighter of two lights (up to a given limit where the light intensity becomes painful), has the greater "pulling power." Thus it is apparent that where even a partially shaded bulb is used within ten or twelve inches of the working space, the eyes will make momentary shifts from the work to the bulb and back again. Even if there is no actual shifting of the eyes, the competing stimuli probably set up antagonistic muscular tensions in the external eye muscles. In either case, fatigue of the muscles which control eye movements results. Wherever a single exceptionally bright spot exists in the field of vision that spot continually competes with all other objects for one's direct gaze—and where the eyes are, that is usually where attention is.

Lamps with metal or other opaque shades are sometimes responsible for eye strain of another kind due to the sharp intensity contrasts produced. The pupil of the eye dilates in response to a decrease, and constricts to an increase in intensity. When a part of the visual field is bright and an adjacent section is much darker, contradictory or antagonistic reaction tendencies are initiated. Physical energy is consumed in this struggle and avoidable fatigue results. The solution lies in illumination which is relatively uniform in intensity, the source of which is diffused and out of the visual field.

The amount of light is a matter of individual preferences which are characterized by great individual differences. Probably it is best to vary the wattage of the study lamp or its distance from the working area until a comfortable intensity is found. The vast majority will find a comfortable, efficient intensity if a lamp fitted with a 100-watt bulb, a good diffusing globe, and a semiopaque shade is placed so the globe is not more than 30 inches from the working space. Smaller wattage bulbs can be used but the working distance must then be reduced. The area properly illuminated will likewise be reduced, with the consequent possibility of increasing annoying contrasts within the visual field.

### *Noise*

Many students have reported that on occasion they have retired to some isolated spot where it was particularly quiet to do an especially difficult assignment. To their surprise they either did not

accomplish much or they found the work more difficult than they had expected. The common experience of many is that work is done more rapidly with less feeling of effort where there is some background of more or less regular noise. A number of laboratory experiments will be presented later that indirectly confirm these uncontrolled, empirical observations.

It is quite understandable how a little noise may help one to study if the fundamental principle of learning discussed earlier is recalled. The active process of learning in which one manipulates, exercises, applies, and rephrases the ideas conveyed through written or spoken words is facilitated by some muscular tension. Moderate intensities of noise produce some muscular tensions, usually of such slight magnitude that they are rarely noticed. Nevertheless, these unnoticed tensions produced by the "out-of-mind" noises are undoubtedly responsible for the added speed of learning.

Some students have also reported that they can study better in the sense that they accomplish more in railroad stations or in noisy lounging rooms than they can at home under conditions which apparently should be more favorable. Careful laboratory experiments also confirm in part these observations but go on to point out a feature which the students fail to report. The additional work accomplished under noisy conditions is bought at a heavier energy cost per unit of work than under quiet conditions. That is to say, work within easy earshot of loud taxi horns, rumbling trains, distracting conversation, is more fatiguing, lump for lump, than the same work done in more subdued surroundings. Some people may work faster under the blast of a radio loudspeaker but few if any persons will spend energy economically by such a procedure.

### *Place Habits*

A great many habits are conditioned by the places in which they usually occur. The gymnasium is the place where physical activity takes place; in the library one usually reads; in restaurants, one usually eats. Merely going to these places often makes one ready for the tasks that usually take place there. Studying in the gymnasium would be difficult simply because the surroundings do not suggest study activity. One way, therefore, of making this "activ-

ity-place" association work to advantage is to reserve at least one table and chair for study alone. The efficient student will do his newspaper reading, "bulling," and kindred nonacademic activities in chairs or at spots other than the one at which he studies. If a study-place habit is well formed, little time will be lost in getting down to work; the preliminary musing will be reduced to a minimum.

The amount of time wasted in preliminary adjustments was revealed by a study of 100 students as they entered the reading room of a large university library. Not a single student gave the first ten minutes entirely to study. They conversed with friends, aimlessly leafed through books or looked around, used vanity cases, read or wrote letters, arranged their clothes or their hair.<sup>3</sup> Many of these actions perhaps are necessary but they are not a part of the study routine. For efficiency's sake, they ought to be left for some other time and place.

Formation of a study-place habit in surroundings that are not ordinarily conducive to good work often explains why some students work best sprawled on a davenport with the radio turned on within reach. Had they formed a place habit in more favorable conditions their efficiency would probably be greater.

The third basic requirement for efficient study is therefore a reserved working space which is conveniently organized for study activities. It should be well lighted, reasonably quiet, and free from numerous periodic distractions if the optimal balance is to be struck between maximum accomplishment with a minimum of time and energy.

#### 4. FACTORS OF ECONOMY IN STUDY

##### *Reading Speed*

It is self-evident that the person who can read fast will have more time left for other activities than one who reads slowly. More important is the finding that those who read fast usually comprehend best. This does not mean that rapid skimming leads necessarily to superior understanding of what is read. It does mean that the factors which aid in rapid reading also aid in understanding the material.

Fast readers do not look directly at each word in a line of print.

Only three or four fixations (points at which the eyes pause momentarily) are necessary. The jumps which the eyes make between these fixations are rhythmically timed and about equally spaced. Slow readers often make the mistake, when attempting to improve, of increasing the speed with which they scan a line. Effort is more wisely directed at lengthening the "visual span" or increasing the number of words taken in at a glance.

A very common fault in poor readers is that of making regressive eye movements. Such movements are "retreats" or "returns" to a word or phrase which did not "register," perhaps because it was midway between two fixations spaced too far apart or for various other reasons. Such regressions require time, adding up to a significant amount if they occur frequently. Perhaps equally important is the fact that such regressions interfere with the train of thought so that concepts and ideas become jumbles at the moment of their first impression.

Children beginning to read silently whisper to themselves. As they gain additional skill the whispering becomes inaudible but their lips, tongue, and throat muscles still move as if they were talking. Some college students have not progressed beyond that stage. Reading must be accomplished without perceptible "vocalization" if speed is to increase. Without these overt movements reading is easier and faster. Ideas, not words are then perceived. In the last analysis, words, isolated and discrete, are merely the raw materials or the vehicles of ideas. Phrases and sentences are the units which convey ideas on the printed page and they are the units which must be comprehended. Reading without visible vocal action allows one to grasp the phrases and hence the essential thought quickly in a minimum of time.

Lack of sufficient technical vocabulary is a common difficulty that affects reading speed and comprehension. This is especially true of students just beginning a new subject. In a misguided attempt to read with speed at all cost, some students skip over new words hoping to get their meaning from the context. Occasionally, of course, these deduced meanings are correct but frequently they are not. The safe procedure is to underline new words when they are first encountered and then to look up their meaning in a general or specialized dictionary before leaving the assignment. If the

deduced meaning is not correct the word will continue to be a stumbling block every time it is met until its meaning has been corrected. Obviously, time is saved by discovering the correct meaning at the outset.

Those familiar with a given field can usually read material dealing with their specialty more rapidly than those unfamiliar with the material. This greater speed is probably due to anticipating continually the next sentence or the essential thought of the next paragraph. The reader is constantly projecting his thoughts beyond the point of momentary fixation and thereby "pulling himself forward." Those who are just starting an unfamiliar topic or a beginning course in physics, biology, or any other academic subject may approximate the specialist's advantage by making an initial quick survey of the principal points or ideas to be covered, as recommended earlier. In that way reading is done with an inkling, if not an understanding, of succeeding topics. Such a survey gives direction to reading and provides minor goals toward which to study. The quick survey, therefore, aids in attaining greater comprehension and speed by providing a series of figurative hooks which the reader grabs to hasten his progress and on which, as he leaves them behind, he hangs his just-found information.

There are those students who read slowly simply because they have never tried to read fast. Fast and efficient reading can only be accomplished by students with intention. Loafing in reading is just as unproductive as loafing at any other job. Determination to read fast may by itself increase speed without a loss in comprehension. Many schools are now equipped with ophthalmographs—eye-movement cameras—that register beams of light from each eye, showing just when the movements occur as one scans a line of print. The instrument gives permanent photographic records that permit a person skilled in their interpretation to discover faults in eye movements not otherwise observable.

Adults who cannot read 250 to 300 words per minute of textbook or nonfiction material of average difficulty<sup>4</sup> will probably benefit by exercise in rapid reading with easily understood materials such as fiction or biography. Such practice should enable the individual to learn the trick of seeing an entire line with three or four fixations. The aim of such practice should be not merely to increase

speed but rather to increase comprehension as well. Twenty minutes practice for twenty days enabled a poor reader to decrease the average number of pauses per line from 15.5 to 6.1.

### *Distributed vs. Undistributed Practice*

Is it more efficient to complete an assignment at a single sitting or should one break up his study period into a number of small sessions with rest or free discussion periods between? A great many laboratory studies have been directed to answer this and allied questions. The studies have employed nearly every type of repetitive learning material as well as subjects representative of a good portion of the animal kingdom, including man. The general conclusion derived from this vast experimentation is that distributed practice is more efficient than massed practice since a given amount of material is usually mastered with fewer repetitions or in less learning time. This conclusion holds only for memorizing, development of skills, and similar kinds of learning where repetition is required. In assignments calling for organization and comprehension of material, distributed or spaced effort may not necessarily prove advantageous. Although there are no existing studies of the influence of spaced effort as related to problem solving, it is a matter of common observation that solutions to difficult mathematical problems are sometimes quickly discovered after a period of rest. We may fall into a simple error in our attempted solution that may go unrecognized until we drop the problem and come back to it later with a fresh point of view.

The practical applications of the studies on repetitive learning are obvious. The person who works doggedly and persistently on a given assignment for hours may be admired for his perseverance but not commended for his efficiency. Neither is cramming on the night before an examination a really effective use of time, particularly if the "crammed" material is new. The same amount of time spent when it could be distributed more leisurely would have netted much more permanent information. The cramming student may be able to pass the examination but the chances are very great that he will soon forget what he wrote in the examination. Cramming, therefore, is merely a moderately effective method of gaining a grade, which in this case fails to represent the student's

real mastery of, or competence in the topic under examination. This is not the kind of scholarship that foreshadows future success.

The reasons for the superiority of distributed practice have not been clearly demonstrated but one or two factors that may be operative can be inferred. In the first place, production or output in a great variety of tasks starts at a reasonably high level and rather quickly reaches a maximum. This initial rise in output, work, or production is known as the "warming-up period." During that time the individual is adjusting himself to the task. Athletic coaches universally recognize the significance of this period and almost invariably give their teams pregame practice so they will be in peak condition at the start of the contest. After warming up, the work curve usually attains a fairly constant level which is maintained for a period of time whose length is largely determined by the nature of the task. A point is eventually reached where the work curve begins to drop rather sharply, indicating a marked and continuing decrease in output per unit of time. Unless special incentives or other stimulating conditions are introduced, the decrease in output will continue until the working period is interrupted. It is clear that if the tail end of the work curve is eradicated by ceasing work when output decreases, the average efficiency for the time spent will be relatively high. Monotony, fatigue, decreasing effort, and increased susceptibility to distractions have all been proposed to account for the tapering off in output as working time continues. Which factor or which combination of factors is more frequently to blame need not be considered at this point. The fact is evident that a rest pause at the proper time markedly reduces the adverse effects.

The situation in regard to repetitive learning is probably much the same as in the field of physical work and exercise, with one or two minor differences. The length of the warming-up or adjustment period will depend upon the strength of one's place habit. In the regular study spot warming up should not require much time. At some unfamiliar study area the necessary adjustment will probably require more time.

Furthermore, the period of maximum returns per unit of time will also depend upon one's motivation, and the amount of organization inherent in, or imposed upon, the material. Organized,



meaningful, integrated material such as Lincoln's Gettysburg Address can be practiced over a longer period with beneficial results than an equal number of unconnected foreign words with their English equivalents.

The periods between working spells need not be wasted in thumb-twiddling, star gazing, or sleeping. One can get a rest from physics problems by memorizing French vocabulary. Spaced practice periods need be separated only by tasks involving different muscles or skills from those used in the principal practice periods.

How long are these work and "rest" periods to be? Exactly at what point should a student switch from one activity to another? No definite answer can be made to these questions in terms of hours or minutes. The principle to remember in this connection is that the work period should not extend beyond the point where output is significantly lowered and the rest period should not last so long that a protracted warming-up period is necessary to continue the main task.

The fact that distributed practice is superior, points to the importance of using those small scraps of time which are usually discarded in aimless daydreaming, thumb-twiddling, or just waiting. That fifteen-minute interval which regularly occurs between breakfast and classes, or the twenty-minute period between gym and dinner may be time enough, if used properly, to raise one's standing a whole grade. Remember that short periods of study often give greater returns, minute for minute, than excessively long periods.

### *Whole vs. Part Methods*

Unguided students frequently adopt the method of learning part of an assignment thoroughly before studying the remainder. This is particularly true in the case of memorizing poems or long speeches, where fairly complete mastery proceeds a line at a time and then the separate sections are pieced together. A method which has proved superior under certain circumstances is the whole method, in which the entire poem or speech is read over and over again from beginning to end.

The experimental evidence on this question is far from being unanimous in supporting any broad general conclusion which will

apply to all students or to all types of learning materials. Reasonably conclusive evidence indicates that the whole method has a greater superiority over the part method when employed by gifted children than when normal children are the learners.<sup>5</sup>

The superiority of one method over the other is also dependent upon the learning material. Pyle and Snyder found the whole method superior as measured by learning time for poetry varying from 20 to 240 lines in length. McGeoch found the "progressive part" to be most efficient when poetry was used. (The progressive part is a compromised part method in which parts A and B are learned separately and then joined before part C is learned.) Vocabulary material is learned in fewer repetitions and retained longer when the whole method is used.

It is entirely possible that the whole method has not demonstrated the superiority which many psychologists believe it possesses in the face of contradictory evidence, partly because of the conventional learning measures. These measures are confined to indexes of learning time or of the amount of material retained. Intelligent comprehension of the material retained has not been measured in any of the experiments. It may be that the whole method, permitting a unified picture of the entire task, enables the student to understand and assimilate better, even though rote memory and learning time are not favored.

The upshot of this discussion seems to be that the whole method is ordinarily advantageous in memorizing connected material of moderate length. The advantage seems to come from the fact that in reading over the entire poem or speech its organization becomes more readily apparent, thus serving as an outline or skeleton into which the parts readily fit. In using the whole method of memorizing the student must remember that the early practice trials often produce the feeling that nothing is being accomplished, thus leading to discouragement. If this attitude can be avoided, the benefits of the whole method will become more apparent.

### *Time of Study*

College and university students generally have considerable liberty to choose the times when they wish to study. Aside from those hours reserved for classes, meals, and employment, the rest

of the day can be used in any way the student may see fit. The question therefore arises: What time of day is best for study?

Several experiments have been conducted to answer this question. Most of them have used nonsense syllables because of their supposed freedom from previous contaminating association. These studies have shown quite conclusively that retention of unorganized materials psychologically similar to rote memory of foreign vocabularies, chemical formulas and kindred items, is facilitated by sleep immediately following the learning sessions.<sup>6</sup> The subjects in one of these experiments learned lists of nonsense syllables just before going to sleep and recalled on the average about 55 per cent of what they learned eight hours later. On other days when retention was tested after eight hours of waking activity, only 10 per cent could be recalled.

The effect of sleep on the retention of conceptual materials as contrasted with rote memory of specific symbols or words has only recently been examined.<sup>7</sup> Newman had students read specially designed short stories at different times during the day or just before going to bed. In each case the students were asked to reproduce the story eight hours later. Ideas essential to the plot of the stories were reproduced equally well after sleep and waking (87 per cent and 86 per cent, respectively). On the other hand, the nonessential items were retained twice as well after an interval of sleep as after an equal interval of waking (47 per cent compared with 23 per cent).

From these studies the suggestion is justified that students should reserve their rote memory work for the study periods just before going to bed. On the other hand, insight into abstract theories or a clear understanding of economic principles, once they are firmly grasped, will not markedly deteriorate during a period of waking activity.

Common sense decrees that studying while fatigued is an uneconomical use of time. This problem has already been touched upon in the section devoted to distributed practice. Some have reported that the oppressive feelings experienced early in the evening sometimes disappear about twelve or one o'clock, so that work seems to progress better in the early hours of the morning. This phenomenon is somewhat analogous to a runner's "second

wind." Probably it indicates the use of reserve stores of energy that should be tapped only on rare occasions when emergencies arise. In some cases the explanation may be found in the reduction of distractions as the evening grows into a night. As long as the student plans his day so as to get his full quota of sleep there is no particular harm in the practice of studying during the early morning hours.

Students in general are prone to prepare for a given class just before the class is called. In so doing they take advantage of the fact that recall of material is best shortly after learning. In some subjects, however, particularly mathematics, foreign languages, and most of the physical sciences, a real advantage is found in studying just after the class. Very frequently hints are given by the instructor for solving problems in the advanced assignment—help that will be easily forgotten within twenty-four hours or less. In addition, the student is frequently "set" for the work just after class, whereas some time later he may not be in the most conducive attitude. It may be objected that the net result of preparing just after a class rather than just before is less retention of material learned so that class performance is inferior. The objection has some merit but can be easily overcome by the practice of a short review just before class. A further advantage can be found in the nature of the forgetting curve.

A great many studies show that forgetting proceeds most rapidly during the intervals just after learning. As the interval between learning and recall lengthens, the pace of forgetting decreases. Material that is retained over a twenty-four-hour interval, will generally be retained with very little loss over a much longer period. Moreover, reviews that occur shortly after the original learning not only require less time to bring back the forgotten information but also decrease the rate of forgetting at a time when it would normally progress rapidly.

One of the earliest systematic investigations of learning and memory is of interest in this connection. Ebbinghaus, in addition to inventing a number of the standard methods of measuring learning, also made some observations on the effect of reviews. Using himself as a subject he memorized portions of "Don Juan" and found that it required on the average, 7.75 repetitions per

stanza before he could recite the material without help. He then reviewed the material at twenty-four-hour intervals for six days noting the number of repetitions on each day necessary to bring back the material to the original level of accomplishment. On the first review he needed only 3.75 repetitions per stanza, on the second review he needed 1.75, on the third, 0.5, and from then on he could recite perfectly without preliminary practice.

Other studies have shown that as the intervals between reviews are lengthened more practice is needed to reestablish the same original level of performance. Consequently, the practice of preparing advance assignments just after a class takes advantage of the proper mental set existing at that time and permits reviews when they are most beneficial.

### *Planning*

Much of what has been said in the preceding pages presupposes that the student will plan his study periods in advance. The relatively unregulated life of college encourages new students to dissipate their time. Yet if the suggestions made in this chapter are to be followed definite planning is necessary. A great many people concerned with study efficiency have pointed out the obvious advantages of constructing a weekly time schedule in which definite provisions are made for all the routine necessities such as sleep, meals, classes, and other fixed activities. The intervals between these definite periods are set aside for studying particular subjects, for recreation, social conversation, light reading, and other relaxations. Those who have never set up such a schedule will be surprised first at the amount of free time actually available and, second, at the comparative ease with which a schedule can be followed. On the initial attempt to adhere to a schedule the student is likely to find some difficulty and may become unnecessarily discouraged. Ordinarily, some modification of the original schedule is necessary and a period of adjustment must be expected before the schedule becomes habitual.

## 5. THE STUDIOUS PERSONALITY

It has been argued that the suggestions given in the preceding sections fail to get at the root of study efficiency. Instead, accord-

ing to this latter view, efforts to abide by a given daily schedule or arrange the physical conditions of work for maximum "output" only scratch the surface. This notion has received support from a recently completed but unpublished survey of Colgate University students who were divided into two groups—one of high, and the other of low academic achievement but statistically equated in intelligence. The men answered lengthy questionnaires covering their preferences, emotions, interests, physical condition, previous activities and achievements, work habits, personality traits, and relationships with people. The data indicate that the studious personality is distinguished chiefly by three reasonably clear-cut traits best described as persistence, a dislike for physical risks, and a set of moral values somewhat above those held by the average college student. The investigators insist that the studious person is one who sets about his work promptly and continues at it in the face of unfavorable circumstances. The studious person is not typically a planner, nor does he necessarily study under the most favorable circumstances.<sup>8</sup> The fact that traits other than persistence also distinguish the studious person, leads to the supposition that real improvement in study efficiency can only be achieved through a fundamental change in the personality. Certainly it is possible for students to adopt many of the suggestions in this chapter without attaining marked academic success. On the other hand, association with studious persons, a concerted effort to alter one's system of values, and the adoption of the best methods of study may be sufficient to change the individual so that his achievement is improved. Perhaps the fact that the studious person is characterized by a high degree of persistence is merely a reflection of an earlier point that strong motives are basic prerequisites for high attainment.

## 6. SUMMARY

The discussion of study efficiency has touched upon several important devices for saving time and energy. This has not been a comprehensive review of the topic but has stressed the outstanding practical problems. Mere familiarity with this material will be of little benefit unless the suggestions are put to some use. Throughout this book students will undoubtedly profit by frequent refer-

ence to the preceding material and application of it to their own activities.

Students markedly below average in scholastic work often require more than generalized recommendations such as those included in this chapter. The causes of poor scholarship are complex, frequently being hidden from the victim himself. Extremely poor students require individual consultations with instructors and others skilled in diagnosing study ills. This chapter has been primarily designed to aid the average student wishing to improve his academic standing.

It will be noted that few specific, rule-of-thumb recommendations have been made. Rather general outlines have been presented, leaving to the individual student the task of devising his own detailed plans of study. In so doing the importance of individual differences has been recognized. Human beings are not made from precisely the same mold; they cannot all be forced into the same pattern of action. Nevertheless, the factors that generally impair efficiency can be described and the student can make modifications in his habits accordingly.

Maximum efficiency in study activities demands a highly motivated student who makes frequent use of the principle of action in learning in a well-arranged working space, properly illuminated and sufficiently quiet. The efficient student makes every effort to read fast without sacrificing comprehension; distributes rather than masses his study periods; employs the whole method of learning wherever it seems practical; studies when not fatigued; takes advantage of existing mental sets; reviews at the times most favorable to maximum retention; and persists at his work in the face of opposing factors.

## Chapter 2

### PSYCHOLOGY AND LEARNING

The title of this chapter might have been psychology and teaching. Instead, the discussion of learning will be continued on a broader base than might be implied if it were limited to the teacher-and-school situation. Probably no other single process within the realm of psychology possesses greater importance or shows its influence in a greater variety of applications than the learning process. All modifications of behavior through experience are the end result of learning. The efficacy of efforts in character building, in establishing buying habits, in training men and women for industrial or military work, in making the best use of schools and colleges, and to some extent the ease with which public opinion is united on a given issue—all these and many other events rest upon the skill with which the known principles of learning are applied.

Throughout this chapter the learning process will be considered from the standpoint of the tutor in contrast to the previous chapter in which it was considered from the standpoint of the learner. The term "tutor" covers a multitude of people within and without the teaching profession—the prison guard charged with a responsibility in rehabilitating his prisoners; the parent desirous of bringing up his children in the way they should go; the army sergeant training new recruits for military duty; the businessman grooming his subordinate for greater responsibility. The list could be extended almost without end. Nearly everyone active in the work of the world has at least a partial responsibility to modify the behavior of someone along rather specific channels. Consequently, in discussing somewhat academically the principles of learning, the foundation is laid for a great many applications in the world of practical psychology.



In brief outline the tutoring process will be considered under three heads: (1) getting learners interested in and aroused to attain some goal; (2) guiding their activities toward that goal; and (3) measuring the results of these activities. These represent the essential steps in any teaching process.

### 1. MOTIVATION

In the previous chapter motivation was discussed from the standpoint of the student. Part of the responsibility for energizing the novice, however, lies with the tutor. Certainly in the regular secondary—and primary—school situations where attendance is compulsory the responsibility is especially heavy and the problem difficult.

That motivation is an important prerequisite to learning is attested by a great many observations. College freshmen pledged to a fraternity were allowed very little sleep for five days during a probation period. At the end of this time they were given a lengthy arithmetic test with the warning that they must pass it or they could not be initiated. These overly fatigued students, working under intense pressure, did much better than unfatigued students who took the same test with no unusual motivation.<sup>1</sup> Elementary-school children were divided into three groups in another investigation. One group was praised for its work in arithmetic, a second group was scolded, and the third was neither praised nor scolded. The first two made more improvement than the last, indicating again the desirability of some form of motivation.<sup>2</sup>

It cannot be emphasized too strongly that the first step in teaching is to stir up, arouse, and interest novices in the task before them. Some have called this process "directing attention," others "exploration." The important principle to bear in mind is that the tyro must feel some need; must desire the answer to some question; must want to overcome some obstacle; must have an urge for some reward.

The principle carries with it the corollary that for maximum benefit the objectives of any teaching, regardless of where it is—in a university, a military training camp, a mental hospital, or a kindergarten—must be clear and precise. Vague objectives lead to vague teaching. Without clear objectives good testing becomes

impossible. The tutor will have little notion as to whether his students are progressing, for the absence of definite goals precludes a positive evaluation of the nearness to that goal.

### *Techniques of Motivation*

The precise methods by which learners can be motivated will be in part dictated by their capacities and by the subject matter of instruction. The techniques that succeed in one situation will not be applicable in another. However, some of the chief methods can be mentioned.

*a. Provocative Environment.* In some of the markedly progressive elementary schools, classrooms have been filled with a vast array of specimens, tools, pictures, and apparatus that provoke spontaneous inquiry. In surroundings of this sort, some observers have noted questions such as: Who made the air? Where does stone come from? Glass? Wood? Why won't wet raffia burn? What are the railway lines for?<sup>3</sup> It is perfectly evident that questions like these provide excellent starting points for effective teaching. The curiosity of young children is aroused by the objects with which they come in contact. Provide the objects; curiosity will follow.

Much the same principle applies in the industrial field. The man next in line for promotion is sometimes unprepared to assume new duties if his superior has rarely taken time to acquaint him with the problems he should be able to solve upon his advancement. When the provocative environment has never been opened to the assistant, it should not be surprising if he fails to develop the zest of his boss or the business sense that ordinarily goes with experience. Some concerns have found that the mere existence of a "Suggestion Box" serves to stimulate questions, provokes inquiries, and furthers learning. Sometimes ambition is dulled, and the willingness to learn how to handle new tasks is thwarted merely because curiosity has never been aroused by the presentation of challenging problems. Learning often starts in a thought-provoking environment.

*b. Life Situations.* Formal school education has been charged frequently, and sometimes correctly, with divorcing education and life. Early efforts to bring school subjects in line with practical

everyday living gave birth to some amusing and grotesque materials. An arithmetic problem that appeared in a now-outmoded text ran something like this: If a nail  $4\frac{1}{8}$  inches long is driven part way into a plank so that it extends  $\frac{7}{16}$  inches on one side and  $2\frac{1}{4}$  inches on the other, how thick is the plank? Notice that if anyone were to obtain the information given in the problem he would need a measuring rule. With such a measuring device, it would be utterly ridiculous to perform the operations suggested to obtain the thickness of the plank.

The chance that what is learned will be unrelated to what will be beneficial in living is not so great outside the classroom. However, some prisons and reformatories teach men to live according to a routine and a system of regulations that cannot be practiced in ordinary life. In peacetime industry, numerous examples could be cited of training programs which emphasized relatively inconsequential details and ignored or minimized the essential features of the task for which the training was established. Interest lags and learning is consequently slow wherever the subject matter is not related to some situation or problem of importance to the learner.

The first chapter of this text was an attempt to tap a life situation of significance to a large bulk of students. One entire course in educational psychology was motivated largely by presenting the problem of efficient study as the central theme. In this case the students read more about educational psychology than was usual in the course and markedly improved in reading speed<sup>4</sup>. Another example is found in the Midwestern teacher of animal husbandry who challenged his students to raise more pigs per sow. In another school plane geometry was taught under the title of "The Nature of Proof," using advertisements, newspaper editorials, political speeches and the like as supplementary materials for applying the rules of mathematical thinking, thereby testing the published conclusions. At the end of the course the students knew as much plane geometry as other students who had devoted an equal amount of time to propositions and originals. Moreover, those who had used the supplementary materials were more facile in spotting illogical deductions. These are examples of the use of life situations that are effective in motivating learning.

*c. Social Facilitation.* A long-distance runner competing against time is sometimes "paced" for short distances by other runners. The supposition is that some close, objective competition, even though it may not really "count," will encourage the distance runner to put forth more effort. Psychologically, this is social facilitation, defined more explicitly as the stimulating effect produced by others on a given individual in a group, all of whom are engaged in essentially the same activity. The sights and sounds of a group of persons participating in a given kind of work may suggest to others in the vicinity that they should do likewise.

In the classroom, social facilitation is effective as shown by an early experiment in educational psychology. About 1900, Mayer gave fourteen boys with an average age of twelve, two series of tests, one series being administered to the group as a whole and the other to each student separately. Under the instructions to work quickly but well, the boys did 30 to 50 per cent more work in the group than when working alone. There were also fewer errors when working in the group.<sup>5</sup> Another investigation showed that work done at home (presumably alone) contained more errors than similar work completed in school.<sup>6</sup>

The obvious implication from these studies is that learning can be expected to progress more rapidly when the learners operate in a group on a common task rather than when working alone. Every tutor and student knows that often a period of individual instruction lacks the zest and interest of a small group. Some authors have pictured social facilitation as a two-way action between the individual and the group. The group motivates the individual, who in turn exerts a similar effect on the group.

*d. Group and Individual Competition.* From an early age children are urged to "be better than Johnny;" "drink more milk than Jane;" "get the highest grades in class." Our Occidental culture is permeated with competition from infancy to senescence. It is not surprising, therefore, that competition should be an effective motive in learning.

A representative study comparing the relative effectiveness of group and individual competition was completed by Sims who used a substitution test on three groups of students. The control group was given instructions for the test but was told nothing

more. A second group was divided into two teams and told that their scores would be compared. The third group was informed that each person would receive a score which would be announced to all. The results were quite consistent in showing the superiority of the last group working under individual competition. All three groups were equal in the beginning according to the pretest, but the average gain after equal practice in substitution was 36.8 points for the control group, 39.7 for the two teams, and 57.1 for the individual competition group.<sup>7</sup>

Teachers find no difficulty in applying the suggestions that these studies contain. The grading system in our schools provides a ready vehicle for individual competition. The spelling bee is an old familiar device that has modern sanction, if employed with discretion. A progressive reformatory helped to speed the rehabilitation of its prisoners by establishing a system of reward for good conduct, and evident progress in revising habits. One mental hospital created some competition among the patients by the practice of posting in a conspicuous place the "grades" of patients showing their progress toward recovery. If competition is the lifeblood of our economic system it is also a powerful motive in the modification of behavior.

A brief word of warning must be sounded about the use of competition. Nearly every contest has a winner—and a loser. Care must be exercised that the same person or the same group does not lose so frequently that discouragement results. Competition in learning is much like politics in government. The results are best when the opposition is strong. Frequent failure is conducive to weaker effort. If an individual feels that he is competing against hopeless odds, little good will result and much harm may be done.

## 2. DIRECTING ACTIVITY

To the uninitiated layman the task of teaching merely consists of telling a novice what to do and then what was wrong with what was done. Such a concept of teaching is, of course, a gross simplification but it does emphasize that part of the teaching process which must now be considered. It is quite obvious that once the interest and energies of learners are aroused, their activities must be channeled toward the objectives of one's instruction. In order to

understand better the basic function of the tutor at this stage it may be well to look briefly at the current theories of learning.

### *Trial and Error Learning*

As one observes animals running a maze, or a child learning to talk, or an adult trying to learn golf, skeet shooting, or how to fly an airplane, he is impressed with the error-and-correction-and-retrial sequence of actions. Responses that prove successful or "good" first occur infrequently and then, as practice continues, the wrong responses gradually drop out. Consequently, according to the trial-and-error viewpoint, learning is a process of selecting from among all the possible responses to a given situation those that bring about the desired end. Through repetition and the satisfaction derived, the correct responses are retained and used in the future whenever the appropriate situation recurs.

### *Conditioned Response*

In other situations where learning is assumed to take place, quite a different feature may be emphasized. The infant who becomes quiet at the sound of approaching footsteps has learned that such sounds usually signal some relief to whatever caused his crying. Or the house dog may cringe and slink along with his tail between his legs when he sees an upraised switch threatening to strike him. Or again, the motorist approaching an intersection jams his brakes and brings his car to a sudden halt, not because of an approaching obstacle but merely because a little red light winks on. Each of these cases represent a response to a "signal" stimulus. Without knowing the previous history of the individuals the responses might appear peculiar or incongruous. In each of these examples a series of responses has been connected to a set of stimuli that originally could not elicit the responses. If examined carefully, these examples of conditioned-response learning, as well as others of like nature, reveal that what appears as the new or signal stimulus for a response was at one time closely related to the original stimulus for that response. Unlike the learning characterized by trial and error, learning through conditioning may take place in a single trial. If viewed from the standpoint of conditioning learning is seen, not as a process of selecting

and stamping in the correct responses, but rather as a process of realigning the connections between stimuli and responses.

### *Insight Learning*

There are still other learning situations that show another feature that has been emphasized by some writers. This feature is termed "insight" and refers to the fact that the individual may quite suddenly discover the solution to a problem or may suddenly grasp the meaning of a proposition or theory. One writer referred to insight as the "Ah-ha" experience observed in oneself when previously obscure relationships abruptly become crystal clear. In these situations there is often a period of extensive trying; tentative solutions are proposed but no improvement is apparent until almost unexpectedly the correct solution appears.

These three ways of viewing learning are not necessarily incompatible. It is quite possible that each may apply under different circumstances. On the other hand, some instances of learning can be described almost equally well by any one of the points of view just discussed. The point to remember from this brief outline of learning theories is that the tutor must be sure the conditions of learning are such as to permit at least one of these processes to operate. In some circumstances, all three may be given full opportunity; with other kinds of material or in other surroundings an analysis may indicate that emphasis should be placed on only one kind of learning.

### *Techniques of Guidance*

What are some of the ways by which the learning activity may be guided? What are some of the conditions under the control of the teacher or tutor that are favorable to learning? What devices are available for hastening learning? What conditions mitigate against learning?

*a. Drill and Repetition.* One of the most ancient and respected principles of learning coming from the trial-and-error theory is that practice makes perfect. The principle has gone under various names: law of exercise, law of use, principle of practice. A precise formation of the law is as follows: Other things being equal, when a given situation is frequently followed by a certain response

or group of responses, the connection between stimulus and response becomes stronger through the exercise so obtained.

There is probably no guidance technique more widely used than repetition in "pounding home" straight information whose retention must depend upon rote memory. Yet in spite of its extensive use and honorable history, there is serious doubt as to the efficiency of practice alone in furthering learning. One of America's foremost educational psychologists, who for many years had supported the so-called principle of practice, performed an experiment that demonstrated its fallacy.

Thorndike<sup>8</sup> supplied several students with pads of paper and pencil, with instructions to draw a four-inch line with one quick movement. The subjects were to keep their eyes closed while they repeated again and again the task of drawing a four-inch line. From 170 to 200 lines were drawn by each student each day for 12 days. None of the lines were seen by any of the subjects and no subject knew how accurate he was. In this manner all factors except practice were kept constant so they would not affect the learning process. The results showed no improvement trend throughout the twelve day period. The students did not improve in accurately drawing a four-inch line in spite of more than two thousand attempts. Thorndike could only conclude that practice alone produces little or no learning.

Are we to conclude, then, that practice, drill, or exercise is of no use in learning? What is the real meaning of this experiment? From one angle it fits common sense since no one would really expect learning under the conditions Thorndike imposed, but yet how else can people learn if they do not practice? The only way in which this dilemma can be resolved is by assuming, first, that factors other than practice are really responsible for improvement, and second, that time is necessary for these other factors to exert their influence. Hence practice, while exerting no influence itself, provides the time for the other factors to get in their good work.

*b. Knowledge of Results.* A host of experimental observations demonstrates that knowledge of the results of one's efforts, with the consequent feelings of satisfaction or dissatisfaction, exerts an important effect upon learning. It has been shown that work with knowledge of results is superior in accuracy and improve-



ment to work without such knowledge. Very likely, had Thorndike informed his subjects in the above experiment of their accuracy after each attempt, they would have shown considerable improvement.

The implication in this principle is that the learners will very probably improve if they know how satisfactorily they performed on tests or quizzes. However, knowledge of results need not wait until time of testing, but may be given throughout a large part of the learning activity. This is particularly true in learning skills as contrasted with developing new attitudes or learning a new set of aesthetic values.

Outside regular classroom instruction we can find many examples of the importance of this learning principle. Few basketball players learn to shoot baskets without knowing whether the ball goes through the basket or not. The business executive probably never learns to handle the delicate problems of personnel relations if he is not aware of how his policies and practices are received by the men in his employ. Without knowledge of results there is almost no chance for learning or the elimination of unsuccessful actions.

Not only must learners know that they are right or wrong, but effective guidance demands that they know specifically what is right or wrong. The critic's comment that literary style is poor is less precise and less effective for learning than a more specific comment about variety of sentence structure with examples of the more satisfactory forms. An irate mother may grasp her obstreperous youngster playing contentedly in the favorite flower bed and administer vigorous corrective measures without indicating that the place of the child's action is at fault and not the action itself. The apprentice patternmaker wants to know not only whether his workmanship passes inspection, but, if he is to learn, what parts of his patterns are below standard.

*c. Praise and Reproof.* Intimately related to knowledge of results is the question of the use of praise and reproof as aids in directing activity. From what has been said in the foregoing sections it is evident that the efficacy of knowledge concerning one's efforts is not derived from some mysterious power imparted to the learner when he discovers his test grade or some other indication of his

work accuracy. The basic effective factor is the satisfaction or dissatisfaction which such knowledge brings. The practical question often facing a teacher is whether he should praise the good people and ignore the poor ones, or ignore the good and reprove the poor ones.

The experimental evidence on this point suggests that both praise and reproof are more effective than ignoring the results. Praise, however, is very probably a more desirable procedure in the vast majority of cases. Hurlock<sup>9</sup> has suggested that students who are praised enjoy their work more than those who are reproofed. In addition, the effects of praise seem to be cumulative, the learners responding by trying harder and doing better work as time goes on. On the other hand, those who are reproofed consistently seem to be less and less influenced by the reproof so that eventually it exerts little effect. Unquestionably also, feelings of discouragement are engendered which are not conducive to further effort. Some evidence from laboratory studies indicates that praise or reproof increases in effectiveness in proportion to its promptness. If learners are informed of the correctness of their responses almost immediately, the effect is much more potent than is the case when test papers are returned a week late or punishment for wrongdoing is delayed for several days.

*d. Reviews.* Teachers very frequently use reviews just before an announced quiz, presumably to aid in recalling material not recently used. The salesman may also employ the same technique in training his men if he will encourage them to review their sales steps in successful deals so as to remember the practices that pay. The principle of review is also exemplified in the many "refresher courses" established in nearly all occupations during the war effort to help key men and women do the best job possible.

Review may serve a purpose other than simply as a reminder. The materials in some cases must necessarily be taught in piecemeal fashion. A review may serve the purpose of bringing together in a unified whole, material that may appear to be unrelated. Some psychologists, indeed, maintain that the only learning that survives over a lengthy interval is that which has been organized into well-knit configurations. According to this position, learning consists of more than memory; it necessitates seeing new rela-

tionships, making new adjustments, reorganizing previous specific experiences. In some instances the so-called review session may serve to bring about this type of learning which was discussed previously under the heading of insight. That is to say, a unifying theme may be developed, thus aiding intelligent comprehension.

In connection with reviews it is well to remember their relation to the forgetting curve, a relation that was mentioned in the previous chapter. Forgetting is generally more rapid immediately after a learning period than at any later time. Moreover, as the interval between learning and review lengthens, the time devoted to review must also be lengthened, if the original degree of mastery is to be regained. It is, therefore, a wise policy to place reviews close to the original learning sessions.

*e. Mechanical Guidance.* The writer recalls an elementary-school teacher who tried to teach him penmanship by guiding his hand as he wrote. While this is not the sole reason for his present semilegible script, it probably was little aid to improvement. It is one form of mechanical guidance which has little to recommend it. Mechanical guidance is applicable only to the teaching of manual skills such as those used chiefly in manufacturing processes. It is generally condemned on the ground that it provides extraneous cues that are absent in situations where the skill to be learned is called for. For instance, writing longhand in an acceptable fashion is required with the proper tools in the presence of an appropriate stimulus situation. The slight pressure of the teacher's hand is an extraneous stimulus to which a person may learn to respond but which is not available when the skill is required.

One study of the effectiveness of mechanical guidance involved the use of both rats and humans on a maze problem. The correct responses were forced on the subjects by means of shutting off the "blind" alleys. Substantially the same results were obtained from both rats and humans, indicating in both instances that retention of the maze habit was most marked in those cases where a little "guidance" was given at the beginning or near the end of the practice period.<sup>10</sup> If a generalization may be made from this laboratory experiment, the effectiveness of mechanical forms of guidance appears to be slight, particularly during the middle stages of learning.

*f. The Use of Rules, Laws, and Concepts.* Analogous to mechanical guidance is that form of verbal guidance which is found in rules and principles of procedure. Such forms are perhaps best exemplified in mathematics and foreign languages. At one time in the history of pedagogy dependence was placed on learning the rules first and hoping that children would automatically apply those rules at the proper time. Later practice in some areas went to the opposite extreme, insisting on the development of the rules from specific illustrations of their operation. At the present time the evidence on the comparative effectiveness of these systems seems to be inconclusive. In mathematics, pupils appear to prefer the inductive method (developing rules from specific illustrations).<sup>11</sup> Other studies indicate that concept formation is accomplished more easily by the deductive approach, that is, presenting the principles first and the illustrations second.<sup>12</sup> Regardless of the procedure used, the teacher must constantly remember that reliance on rules that are learned parrot-fashion will prove unfortunate. It is easy enough to learn the rules; it is much more difficult to teach students to apply them at the proper time.

*g. Concluding Statement.* The effective techniques of guidance are few. This is perhaps to be expected, for the tutor's task at this stage of learning is merely to canalize activity, preventing the novice from becoming confused with respect to the ends to be attained. In no sense are the above suggestions to be interpreted as meaning that mistakes are to be prohibited. The experiment cited in connection with mechanical guidance certainly indicates that making some errors facilitates ultimate mastery. The tutor's essential function at this point is merely to prevent the errors from becoming too serious, and to keep students headed in the right direction.

#### 4. TESTING

Having discussed how learners are motivated and how the motivated activity is directed, consideration must be given to certain problems related to determining the extent and quality of their accomplishment. Although this section applies particularly to any rather formalized teaching program, the principles of testing discussed here will find application in connection with the chapters

dealing with Employment Psychology and Vocational Guidance.

In the less formalized teaching by a parent, or a store manager training his clerks, or a Y.M.C.A. secretary concerned with character-building, the testing takes a less routinized form. Questions may be mixed with the presentation of new material, or actual trials on a new task are used to evaluate the novice's performance. Testing of one sort or another is essential to reveal whether the time is ripe for additional teaching, regardless of the setting in which that teaching takes place.

### *The Dual Role of Tests*

Tests may serve two functions: (1) as measures of attainment, and (2) as instructional devices giving students knowledge of results indicating specific deficiencies. The second of these has already been discussed in the previous section. It should be emphasized, however, that the instructional function can only be served if students are informed of the correctness of each question's response. Further, the promptness with which this information is given is also of importance.

As measures of attainment, tests are largely for the teacher's information. They indicate, if properly devised, how efficient the teaching has been. They also show how well students have mastered material which the teacher believes to be essential. The test results often indicate whether reteaching of the same material is necessary or whether a new topic may be introduced.

### *Statistical Characteristics of Tests*

To understand the significance of much that has been written on the topic of measuring human abilities objectively, requires familiarity with the two principal characteristics of tests: reliability and validity. These terms are basically statistical in nature but can be defined in nonstatistical language.

*a. Reliability.* The reliability of a test is the extent to which it remains stable as a measuring instrument. In devising almost any test of school attainment it is usually necessary to select questions or items that "sample" the total attainment of the class. For instance, in testing for knowledge about the Civil War it is obviously impractical to ask students to write all they know on

this topic. Instead, a teacher might frame a question about the immediate causes of the war, or about particular military or diplomatic moves that brought the war to a close. In other words, a sample of the student's accomplishment is tested and from that sample inferences are made about his total accomplishment. Reliability refers to the extent to which response scores on one test agree with response scores on another test, each sampling the same material and of equal difficulty. If the agreement is high between the tests, then reliability is high. If the agreement is low, the reliability of one or the other, or perhaps both, is low.

In practice, the reliability of a test is determined by means of the correlation technique.\* A correlation coefficient is merely a number, varying between  $-1.00$  and  $+1.00$ , indicating the extent to which two measures of a given group of individuals vary in accord with each other. A  $+1.00$  means that as one measure increases by a given amount, the other increases also in a constant proportion. A  $-1.00$  indicates that as one measure increases the other decreases; the amount of change in each measure likewise always remaining a constant proportion to each other. For purposes of predicting one value from the other a  $-1.00$  is as good as a  $+1.00$  coefficient. The error of predicting in such cases is zero. However, in psychological and educational tests  $-1.00$  or  $+1.00$  correlations never occur. Here the correlations are not "perfect," yet there is some tendency for one variable to increase or decrease in step with another. The correlation, for example, between intelligence and scholarship is approximately  $+0.65$ ; between grades in one semester and grades in the semester following, about  $+0.78$ ; between height and intelligence of persons all of a given age, about  $.00$ —indicating no relationship between these last variables.

When the correlation technique is applied to test scores to find the reliability of a test, two forms of equal difficulty covering the same material may be used. In some instances where "new type" examinations are used, a single test is split into two and each half scored separately, the scores then being correlated. Tests with reliabilities of approximately  $.9$  are quite satisfactory.

\*The mathematical calculations by which a correlation coefficient is determined and the various kinds of correlations will not be discussed here. Any standard statistics text contains the necessary information.

It is easily understood why the reliability should be high for satisfactory tests. A yardstick that changed length markedly from day to day or could be stretched and shortened depending upon what was being measured would be of little use and would not be reliable. The reasons for discarding the yardstick with low reliability apply to school tests as well.

In the everyday work of the classroom teacher there are few attempts to determine the reliability of tests. The reasons that apply in any given case where this is true can usually be found in one or more of the following conditions: lack of time, lack of interest, slight chance that the test will ever be repeated, demand for immediate grades, too few students for proper statistical treatment.

*b. Validity.* Validity is the degree to which a test measures what it is intended to measure. No one would compile a test consisting of history questions with the intention of measuring mathematical accomplishment. On the other hand, a teacher may unwittingly devise a test covering mathematical material that does not test those skills which she has taught. In one case that came to the writer's attention, a teacher had described the operation of Boyle's law in physics. He had conducted experiments demonstrating its operation. Everyday examples illustrating it had been recalled. He had answered several student questions. On a test he presented a problem that required ability to solve a simple algebraic equation calling for the application of the law to a device with which few students were acquainted. The whole thing was confusing to the students and disappointing to the teacher. The test question dealt with abilities that had not been taught in connection with Boyle's law and for that reason was not a valid measure of the teaching or of the students' attainment in the topic.

The question of validity cuts across a number of areas, particularly in educational practice. The essential difficulty in determining the validity of a test is in deciding upon precisely what ought to be measured. In order to make this decision one must formulate clearly the objectives and aims of every lesson. Once this has been accomplished, then the objectives must be translated into test questions. If these tasks have been satisfactorily completed the test will be reasonably valid.

It must be admitted that such a concept of validity is not conventional. Ordinarily the validity of a test is thought of in terms of its correlation with some other independent measure of the characteristic under examination. For example, the validity of a test of mechanical ability may be correlated with ratings by foremen or with wages of machinists. A test of intelligence may be correlated with grade placement, or with class marks. In these cases validity is expressed in terms of the correlation coefficient. In finding the validity of a given subject-matter test there is no second independent measure of the students' knowledge. It is necessary, therefore, to make a subjective evaluation of the degree to which the test items call for skills that are the objectives of the teaching.\*

The determination, then, of the validity of a given test does not necessarily require extended statistical analysis. However, a more difficult kind of analysis is required that calls for a careful scrutiny of objectives, materials taught, and questions asked. Returning to the example of the physics teacher mentioned above, it seems quite evident that what he was testing was the ability to apply the law to conditions that had to be abstracted from a description of a machine. What he had taught was something quite different. The objectives of his teaching can only be surmised but whatever they were they failed to dovetail with either his teaching or his testing. The original definition of validity was the degree to which a test measures what it is intended to measure, implying a pre-conceived and clear notion of intentions.

### *"New Type" vs. Essay Examinations*

The relative merits of what have been generally called "new-type" examinations and the more conventional essay examinations have been a frequent topic of discussion among teachers and stu-

\*Some investigators insist that the validity of particular items on a test can be determined by comparing the number receiving high total scores who "passed" the item with the number receiving low total scores who also "passed" the item. Those items in which the first number is less than the second are discarded, thereby making the difference in the revised total scores greater and presumably increasing the validity. The procedure is open to the serious objections that: (1) existing differences in scores are merely exaggerated; (2) the total score is not independent of grades on individual items; (3) the retained items may, or may not be correlated with "true" attainment; (4) only incidental attention is given to the relation between test items and the objectives of the course.



dents alike. The new-type examinations are identified by a number of characteristics. (1) They require students to indicate their answers by some simple sign or by a single word or phrase. (2) The number of questions is usually much greater than on essay tests covering the same material. (3) Usually each item is simply scored either right or wrong.

The advantages of such examinations are easy to enumerate. In the first place they lend themselves to objective scoring, reducing the need for careful reading and judgment on the part of the teacher in grading the papers. Second, they sample in a given time limit a larger part of what the student knows. Third, because the sample tested is larger, such tests are likely to be more reliable. Fourth, they are easily connected with educational objectives, thereby facilitating their evaluation with respect to validity.

On the negative side is the charge that they fail to test thinking, organization, and evaluation of material learned. Their use is said to encourage students to memorize rather than truly learn and assimilate material so that it can be used in places other than in the examination room. There is some merit in this charge, yet many new-type examinations stand as clear refutations. Cleverly conceived objective tests can measure thinking and evaluation of learned materials. In some cases the construction of test items directed to this end will be found difficult and extremely time-consuming. Under such circumstances the teacher will do well to remember that papers prepared outside of class without the pressure of an examination may serve to evaluate the students' accomplishment in this respect.

A second disadvantage not generally recognized is the care with which objective test items must be prepared. This disadvantage becomes greater as the number of students taking the examination decreases. Many teachers have the mistaken idea that objective tests are timesavers. This is only true when the number of students is large or when the test items are to be repeated in subsequent years. It is true that the time required to grade objective tests, in spite of their length, is usually much shorter than that required for grading essay examinations. However, if an objective test is to enjoy the advantages mentioned above, it must be composed with

care to insure that the questions are (1) not ambiguous, (2) in good English, (3) intimately related to the objectives, and (4) the correct answer is clear to the good student while the alternative answers are reasonably plausible. To meet these requirements is not easy and in some instances may require more time than the construction and grading of an essay examination.

Essay examinations, on the other hand, call for skill in composition and organization of materials. It is, however, a moot question whether these abilities are better evaluated by papers prepared outside of class. Generally speaking, the best literary achievements are usually not produced under circumstances such as are found in an examination. The unreliability of grades on essay examinations is almost notorious, the coefficients rarely being over .5.<sup>13</sup> One study revealed that a given history paper read by seventy history teachers was graded from 43 to 92, 100 being perfect score.<sup>14</sup> This is, of course, an extreme case and is not typical of the disagreement usually found on essay tests. Without going into the details at this point, it is possible to devise semi-rigid scoring systems for carefully worded essay questions so that competent graders will arrive at scores having reliabilities of .78 or better.<sup>15</sup> Nevertheless the reliability of objective tests is usually higher than essay examinations.

The conclusion concerning "new type" vs. essay examinations seems to be that the former, if properly constructed with imagination and ingenuity, can serve adequately as measures of attainment in most skills. Occasionally it may be necessary to supplement objective tests with essay questions or else employ papers prepared outside of class as measures of abilities to organize and evaluate.

## 5. SUMMARY

This very condensed discussion of learning from the standpoint of the tutor has treated three main topics: the motivation of behavior for learning, the guidance of learning activities, and the evaluation of what has been accomplished or learned. It was emphasized early in the chapter that clear, definite, and attainable goals must be decided upon before the work of teaching can begin. Once these goals have been formulated it becomes relatively easy to make use of a number of techniques in energiz-

ing students and making them eager to attain the goals. The use of a provocative environment, life and meaningful problems, social facilitation, group and individual competition are typical techniques. The guidance of learning can be accomplished through the use of drill and repetition, giving some knowledge of results, utilizing reviews, rules, laws, and concepts. Before one can decide which of these methods is best for his particular situation he must have some understanding of at least the three most important points of view toward the learning process—points of view which have been labeled trial-and-error, conditioned response, and learning by insight. The problems surrounding the evaluation of one's teaching efforts have been treated almost entirely from the standpoint of the school situation, stressing the concepts of reliability and validity as they apply to measures of attainment. Finally, a comparison of essay vs. new-type examinations indicates their respective values in a testing program.

## 2. PSYCHOLOGY APPLIED *to Mental Health*



## Chapter 3

### PRINCIPLES OF MENTAL HEALTH

Professional and lay attitudes toward the mentally ill have undergone a radical change within the last seventy-five years. Prior to the latter part of the nineteenth century persons with profound mental disorders were treated either as *infrahumans* or as occult demons, caged and chained to prevent harm to themselves and others. A favorite prescription for "gathering the remembrance of a lunatic" in sixteenth-century England was to beat and cudgel him until he had regained his reason.<sup>1</sup> Of the treatment in colonial times in America one historian writes:

The mentally ill were hanged, imprisoned, tortured, and otherwise persecuted as agents of Satan. Regarded as sub-human beings, they were chained in specially devised kennels and cages like wild beasts, and thrown into prisons, bridewells and jails like criminals. They were incarcerated in workhouse dungeons or made to slave as able-bodied paupers, unclassified from the rest. They were left to wander about stark naked, driven from place to place like mad dogs, subjected to whippings as vagrants and rogues. Even the well-to-do were not spared confinement in strong rooms and cellar dungeons, while legislation usually concerned itself more with their property than their persons.<sup>2</sup>

Through the energetic work of Dorothea Dix, a crusading, unmarried New England schoolteacher, the public and legislatures of eastern United States, Canada, the British Isles, and the Continent were aroused to the inhuman treatment of the mentally ill. During the forty years from 1841 to 1881 she carried on a zealous campaign which resulted directly in the founding or enlarging of at least thirty-two mental hospitals—an astonishing record of humanitarian reform for a woman who began after she was forty years old.

But Miss Dix was primarily concerned with the welfare of those

already insane. It was Clifford W. Beers' book, *A Mind That Found Itself*, published in 1908, that directed attention to the prevention of mental illness. Beers, a Yale graduate, told in his book of his own mental collapse, the bad treatment he received in three typical institutions of the day, and his eventual recovery in the home of a friendly attendant. One year after the publication of the book the National Committee for Mental Hygiene was organized and has continued to function with increasing effectiveness to the present time. In addition to carrying on the campaign for increased facilities started by Miss Dix, the National Committee has published a journal and leaflets disseminating research and discursive articles on human adjustment; has sponsored mental-hygiene clinics in key cities; has encouraged research and constructive legislation bearing on mental health agencies.

Within the medical and psychological professions a collateral stream of influences has contributed to a growing interest in mental hygiene. Sigmund Freud, working in Vienna during the 1890's, developed his doctrines of psychoanalysis which placed the origin of many mental illnesses in unfortunate childhood experiences. Psychoanalysis was first confined to discussion groups of intimate friends in the cafes of Vienna but gradually filtered through the psychological literature to America. Its formal introduction to American scientists came in 1909 when Freud, with his disciple, C. G. Jung, delivered a now-famous series of lectures at Clark University. The heated discussions in the years following these lectures further publicized the doctrines to American psychologists and the public alike, focusing attention on the prevention of mental disorder.

Important for this discussion is the growing conviction that many serious mental illnesses develop gradually from unusual attitudes, beliefs, or peculiar ways of meeting the everyday problems of modern living. Mental illnesses are not the unpredictable phenomena they were once thought to be. In the space of little more than fifty or seventy-five years the attitude toward the insane has completely changed, swinging now to the belief that some mental disorders can frequently be foreseen and prevented.

It is for this reason that a discussion of mental health, its signs and principles, should be of interest to students for their own

welfare. In addition, those who expect to be either parents or teachers will find in the following pages suggestions that may be helpful in molding the personalities of young children. It is not intended to provide complete information for training clinical psychologists or psychiatrists, but rather to provide enough information so that the educated person may appreciate the importance of the problem and gain an understanding of his own and others' "mental mechanics." The discussion will be confined to those conditions leading to functional rather than organic abnormalities for two reasons. First, because the basic problems of organic disorders fall more properly in the field of medicine (bacterial, traumatic, and toxic conditions; degeneration or abnormal growths in the nervous system). Second and more important, the functional disorders representing about 45 per cent of the first admissions to mental hospitals,<sup>3</sup> are at least theoretically preventable.

### 1. WHAT IS THE OBJECTIVE OF MENTAL HYGIENE?

Briefly, the objective of mental hygiene, like physical hygiene, is not merely the prevention of illness. It is positively aimed at the development of a wholesome personality so well integrated that the individual balances his intellectual, emotional, and physiological satisfactions with temperance; is reasonably content and optimistic; and experiences a minimum of strain and friction in his relations with his associates. One mental hygienist expressed it this way:

Let us define mental health as the adjustment of human beings to the world and to each other with a maximum of effectiveness and happiness. Not just efficiency, or just contentment—or the grace of obeying the rules of the game cheerfully. It is all of these together. It is the ability to maintain an even temper, an alert intelligence, socially considerate behavior, and a happy disposition.<sup>4</sup>

The simplicity of these statements is perhaps misleading as to their wide implications. To get a better perspective of the individual in robust mental health, some of his specific characteristics should be considered.

First of all, such a person has a clear insight into his own limitations. He may not necessarily be brilliant but he shows his mental



health in frankly recognizing his intellectual limits. He tries against heavy countertendencies to evaluate his own achievements and those of others in an objective, dispassionate manner. This self-evaluation is not carried on in a morbid, introspective attitude. Rather the spirit is one of gaining information and insight so that the conflicts, superstitions, and fears bred of ignorance are reduced to a minimum.

Second, the well-adjusted individual adapts himself to the unchangeables of living with a minimum of emotional energy. For instance, he does not fret when a freight train blocks his path, or when other of the minor inconveniences of living interfere with his more pleasurable activities. This does not mean that he must be without convictions, playing the part of a spineless fish, buffeted by the squalls of circumstance. The major ills of humanity may call forth his attention, interest, and criticism. He may exert the pressure of his opinion on the issues of the day, but unless he is in an unusual position of influence or authority, his energies are directed along paths that are compatible with the existing order.

Parenthetically, much of our social progress is traceable to reformers who have been profoundly dissatisfied with the existing order, parading their stinging criticisms in pamphlets, speeches, and books. To these men and women society as a unit owes a debt. Many of them serve merely to sensitize a phlegmatic public to unrecognized problems. However, to those persons in authority who also recognize the problems and use their position and power to effect reforms, society is more indebted. From the standpoint of the individuals, the pure reformer unimplemented with power uses his energies less efficiently and is probably in poorer mental health than the executives who effect progressive changes.

Third, the mentally healthy individual adjusts to changes in himself and his surroundings. "When in Rome, do as the Romans," is a trite proverb with much psychological merit. Actions conspicuous by their nonconformity are likely to create friction and perhaps open conflict with one's associates. Moreover, the sixty-year-old matron who persists in acting like a twenty-year-old maiden has not adjusted to the growth and developmental changes that have taken place within herself. Pining for the "good old days" shows at least a partial unadjustment to the good of today.

The individual who grows old gracefully—who, “When he becomes a man, puts away childish things”—is mentally serene. His interests and attitudes have matured and mellowed. He remains mentally supple and pliant, weighing new propositions in the light of his experience and not in terms of his own unreasoned prejudices.

Fourth, the well-adjusted individual leads an orderly existence in which the ordinary necessary functions of living—eating, sleeping, dressing, and the like—are routinized so that time and energy are more readily available for the more important constructive aspects of life. American industry has long since discovered the importance of standard operations for given jobs. When work is reduced to habitual actions, dividends accrue in saved time and effort. The individual who leads an unregulated life with meals and sleep at irregular hours is not only gambling with his physical health but is not disciplining his appetites for his own ultimate benefit. Only a few exceptional geniuses have achieved marked success in the face of erratic, unsystematic living. Those less well endowed who aspire to a modicum of success must use their powers to the utmost. To do so without undue strain and tension demands at least a flexible schedule and a well-regulated system of “maintenance habits.”

Fifth, the individual in vigorous mental health is not an extremist in the satisfaction of any single motive. Society looks askance at gluttony and miserliness. The mental hygienist would discourage all forms of extreme indulgence of any drive, whether it be food, sex, social approval, or desire for mastery. Instead, the well-adjusted person strikes a balance in his actions so that all drives are satisfied to the maximum but not to the detriment of any one. Few, of course, approach this ideal, because of the present era of specialization in which special knowledge or talents are unusually rewarded. One or more special interests is indulged therefore, at the sacrifice of others, thus building a one-sided personality. On the other hand, there is little excuse for a man to become so tied up to his own job, or a woman to her children and house, that there is no time for satisfactions in hobbies and other legitimate actions. Mental health demands a well-rounded personality with a wide variety of interests.

Sixth, mental health connotes satisfactory social adjustments. We live in a society where no man is sufficient unto himself. Each person must deal with other people at some point in his existence as a normal contributing citizen. Those who find such contacts irksome, irritating, and in turn are judged crabbed and cantankerous, have failed to adjust.

Finally, mental health demands that the individual derive wholesome satisfactions from his chief occupation, regardless of the monetary returns. This means basically that occupational adjustment is at least an important determiner of mental health. In this connection one may recall the discussion of primary and secondary motives in Chap. I. Primary motives are those satisfied by the inherent nature of a task, as illustrated by the sportsman tramping through the woods for a fleeting shot at a partridge which he does not like to eat. Secondary motives are those in which the satisfactions are extrinsic to the task. The salesman who works only for the commissions or salary, deriving no other important satisfaction from his job, is very likely a poor salesman and is most certainly less well adjusted than one who likes the give and take of selling.

These, then, are the marks of a well-adjusted personality. They are not an exhaustive list of features characterizing mental health and neither should any single individual be expected to possess all of them. However, they are the chief features of an ideal condition seldom if ever achieved completely.

## 2. MECHANISM OF ADJUSTMENT AND THWARTING

In the realm of physical hygiene the mechanisms whereby contagious diseases are acquired, ulcers developed, and infections spread are fairly well known. But what are the mechanisms whereby mental disorders develop? How are they acquired? The answers to these questions are found in related topics: (*a*) the mechanism of adjustment; and (*b*) the predisposing and exciting factors in mental illnesses.

The concept of adjustment has a special meaning in psychology. It must first be recognized that all living things are active. Sometimes actions take place automatically without much thought or hindrance, as in walking. But every so often habitual, free-flowing

activities are temporarily halted, and an adjustment to the thwarting conditions is necessary. Adjustments, then, do not include all behavior forms. Instead, the term is applied only to those responses made by the individual when the normal flow of on-going activity is blocked.

### *Factors Productive of Thwarting*

The factors chiefly responsible for blocking human actions may be arbitrarily classified under three heads. First are environmental factors. The college freshman away from home for the first time must make numerous adjustments because distance prevents the usual satisfactions derived from parental attentions. Lack of food may prevent the satisfaction of hunger. A storm may prevent reception of one's favorite radio program, or threatening weather may prohibit a long-anticipated lawn party. In every case personal adjustments are necessary because material or environmental factors interfere with the usual modes of action.

Second, normal satisfactions may be blocked by conflicting antagonistic interests and drives. A number of years ago William James, sometimes called "the dean of American psychologists," expressed very neatly the dilemmas of living:

I am often confronted by the necessity of standing by one of my empirical selves and relinquishing the rest. Not that I would not, if I could, be both handsome and fat and well dressed, and a great athlete and make a million a year, be a wit, a *bon vivant* and a lady killer, as well as a philosopher; a philanthropist, statesman, warrior, and African explorer, as well as a "tone-poet" and saint. But the thing is simply impossible. The millionaire's work would run counter to the saint's; the *bon vivant* and philanthropist would trip each other up; the philosopher and the lady-killer could not well keep house in the same tenement of clay. Such different characters may conceivably at the outset of life be alike possible to a man. But to make any one of them actual, the rest must more or less be suppressed.<sup>5</sup>

Blocking that comes from the conflict in drives perhaps occurs more frequently today than in previous years. People are faced with a greater number of choices in modern civilization. Shall one go to the movies, listen to the radio, read any one of a dozen magazines, or go to the concert? Earlier generations were not faced

with the variety of choices now open. Moreover, evidence from studies of experimentally induced neurosis in animals<sup>6</sup> suggests that adjustments in conflict situations become more difficult as the differences in the lines of possible action are decreased. It is easier to choose between a light suit and a dark one than it is to pick the precise shade of gray that meets one's fancy. If one decides to go to the movies he must then choose a particular show, perhaps also considering differences in price, comfort, and convenience offered by the competing theaters. Industrial society has not only provided more possible choices in food, clothing, shelter, entertainment, and education, but has also made necessary finer and finer discriminations. Satisfactory adjustments to conflicting drives are probably increasing in frequency and difficulty.

Third, the normal course of action may be inhibited by real or imagined personal defects. A teen-age girl motivated by normal sex impulses but handicapped in gaining male attention by excessive weight resorted to boisterous tomboy actions, assuming a spirit of bravado and butting into boys' groups with a "hail-fellow-well-met" attitude. A more satisfying adjustment might have developed had she cultivated a musical talent, tried to reduce, and worn more attractive clothes. Sometimes an offhand remark not made directly to a child may arouse a fear or suspicion of unreal personal defects and may be the cause of maladjustments for some years. In one case an unusually sensitive boy overheard a remark which he interpreted to mean that he had a weak heart. Even though he never had any direct confirmation of that remark, he avoided all kinds of strenuous activity, suffering the plagues and affronts of his friends when he refused to participate in their games. Only when he reached college and had a complete physical examination did he discover his heart was normal. The college program of compulsory education helped somewhat to overcome his shy, hypochondriacal manner, but for years he carried the effect of his supposed weakness.

### *Criterion of a Good Adjustment*

It becomes apparent that some adjustments are good, some harmful, and still others are indifferent. By what criteria are we to evaluate adjustments? Which ones contribute most to mental health?

Fundamentally, those adjustments are good which result in the maximum satisfactions for the longest period and render the individual more capable of solving conflicts in the future. Whenever a line of action toward a given end is blocked, tensions are aroused which find relief only when a person attains the goal. One may find temporary relief from certain tensions by retreating from the thwarting obstacle and engaging in a line of action which is uninhibited. The student who wants to attract the attention of his classmates but is too unintelligent to get high grades or too unathletic to win a letter, may find a temporary satisfaction by getting boisterously drunk at a football game. Such an adjustment is obviously not so good as engaging in some extracurricular activity which brings more lasting and merited student attention. The various forms of unhealthy adjustments will be discussed more fully later. The point here is merely to emphasize that adjustments are good when they result in a resolution of tensions for a relatively long time, and provide a basis for future successful adjustments.

To review briefly, adjustments are required whenever action is blocked. Environmental conditions, real or fancied personal defects, or mutually antagonistic drives are the principal factors which from time to time prohibit immediate release of tensions. The best adjustment to these inhibiting influences are those lines of action which result in the most complete resolution of the conflict for the longest time.

### 3. SOME TYPES OF ADJUSTMENT

In the preceding section it was mentioned that sometimes a person may retreat from a given line of action that may be blocked and engage in other activities which may bring greater satisfactions. This is only one of the several ways by which he may adjust to conflict. What are these various types of adjustment? How do they differ from one another? What is their nature?

#### *Compensation*

One of the very common ways of adjustment, particularly to situations that threaten one's self-esteem or block the drive to mastery, is compensation. The student who fails to make good

grades in sciences may finally stop trying in that field and compensate for his failure by working harder than usual in languages or in some other subject where his efforts are more productive. Compensations, if not carried to extremes, may be very satisfactory adjustments for two reasons. First, compensatory habits often result in real achievements, bringing the individual justified rewards of a rather permanent nature. Second, they tend to divert attention from personal deficiencies that might otherwise be a source of increasing tension.

Some men, for example, have attained eminence largely because of apparent attempts to compensate for some deficiency. Beethoven, Mozart, and Bruckner composed many of their best works after becoming deaf. Gonnelli, an Italian sculptor, became blind at the age of twenty but was able to execute portraits in terra cotta, making remarkable likenesses after passing his fingers over a face. These men compensated for their deficiencies by gaining eminence in fields where their defects were the greatest handicap.

Hitler's thirst for power and domination may be a compensatory reaction from the humiliation suffered first when he was refused admission to a school of art, and again when the German army in which he was a corporal was defeated in 1919. A third setback came to him when as leader of an abortive postwar revolution he was imprisoned. Each of these personal misfortunes suggested the inferiority for which he has compensated by propagandizing the doctrine of Aryan superiority and conniving to gain complete dictatorship for himself. The weaknesses of men or their early failures have sometimes been the goads that stimulated them to achieve renown, if not honor.

Not all compensations, however, are effective in achieving the desired ends. Most people have at least one acquaintance who is small in stature but loud in maintaining his "rights"; belligerent and bellicose in his actions. Such a person is often shunned by his acquaintances and fails at least partially in making good social adjustments, even though he may relieve his feelings of inferiority and physical weakness. Sometimes, in order to obscure the individual's basic incompetence, compensations take the form of sarcasm and biting ridicule. A college instructor maintained his position in spite of deficient preparation and lack of training

largely because he cultivated an ability to joke his way out of embarrassing situations which might force him to reveal his ignorance. The skilled observer of human nature can often detect in many of the extreme forms of behavior a basic weakness that is the real cause for compensation.

Parents sometimes compensate for their own defects by insisting that their children be strong where they have been weak. Blasted ambitions of one generation are occasionally saddled on the next. The corner druggist who wanted to be a physician may force his son into the medical profession. The woman who trained for a career as a linguist and translator but found marriage more secure and disappointing, may channel her daughter's interests away from men toward foreign languages. Compensation through one's children, wife, or husband is fraught with considerable risk. The druggist's son or the linguist's daughter may have little interest or capacity in the occupations chosen for them, but parental domination forces them to spend frustrated years in preparation for an unsuccessful struggle in jobs they dislike. The net result is often disappointing to both generations.

Compensations are both good and bad. As long as they remain within the limits approved and favored by society, compensatory adjustments for deficiencies contribute to mental health. However, "overcompensation" often incurs the disapproval of society, and handicaps the individual's adjustment.

### *Rationalization*

Rationalization is a process of thinking whereby plausible but fallacious reasons are assigned for actions whose true motives are not acceptable. It is not necessarily a process of logical thinking. Indeed, it may be quite illogical, but it serves to justify actions or provide excuses for failures. It has sometimes been described as finding acceptable reasons for actions already decided upon.

The student who is torn between studying for a quiz and going to a particularly good movie may decide on the latter. He justifies his choice by thinking that the relaxation will do him good; will freshen his mind for work later in the evening; and, after all, his general education demands that he be conversant with this "great, epoch-making masterpiece." Usually the student does not admit



to himself or others that the most important reason for going to the movies is simply because studying is a bore and a tedious job, while the show promises to be diverting. Spurious reasons are pushed to the fore while the more fundamental motives are obscured.

Numerous examples of rationalization occur every day. A woman of limited means but inordinate pride buys an expensive washing machine with many safety devices, rather than an equally good washer at a much lower price without the safety features. She justifies her action by declaring that one accident with the cheaper washer would more than offset the difference in price. Her more fundamental but unexpressed reason was probably her desire to impress her neighbors. In this case, as in almost all rationalizations, there is a germ of truth in the assigned reasons.

Sometimes rationalizations take the form of blaming the incidental cause. The sprint swimmer blames the choppy water for his failure to win the race. The poor carpenter blaming his tools is another trite but familiar example of the same mechanism.

### *Projection*

An individual's deficiencies, feelings, ideas, or motives may be projected on others. The Ursuline cloister of London between 1632 and 1639 was the scene of a very dramatic mass projection. The nuns accused a good-looking priest, Urbain Grandier, of bewitching and seducing them. Apparently the unlucky priest appeared to the nuns as a phantom, amorously assailing them with enforced and shameless tenderness. Their sexual hallucinations were so real that the accusations brought against the innocent priest had the appearance of absolute truth and convinced unprejudiced judges, so that Urbain Grandier, after being put to the most extreme tortures, was burned to death.<sup>7</sup> Less dramatic projections are found, for instance, in the poorly prepared student who attributes his failure in a given subject to the instructor's alleged inadequate presentation.

Rationalizations and projections are ordinarily not particularly harmful, provided they are recognized for what they are. In extreme cases they may lead to serious consequences as illustrated in the case of Urbain Grandier. If, on the other hand, one is aware

of the nature of rationalizations and checks his thinking by a dispassionate evaluation of his behavior, the development of elaborate false beliefs can often be forestalled. Blaming fate, someone else, the tools supplied by management, or some other minor contributing factor, will be less likely if it is understood that by so doing one is only fooling himself and thereby postponing the time when he must correct his own imperfections.

### *Sublimations*

Sublimation is a process akin to compensation in that it involves directing one's energies into substitute forms of behavior. Compensations are usually thought of as substitutes for some real or fancied deficiency. Sublimations, on the other hand, are usually substitutes for behavior tabooed by society.

The most common sublimations are those prompted by the social restrictions placed upon the expression of rage and sex impulses. Both forms of behavior, if given free rein, would bring the individual into serious conflict with the organized forces of the community. It becomes necessary, therefore, for everyone at some time or other to redirect these impulses into channels sanctioned by the mores of his group.

The sublimation of the sex drives is particularly difficult for unmarried adults. For the single woman there are, of course, a number of occupations that provide very satisfactory outlets for love interests. Nursing, teaching, child-welfare work, are rich in opportunities to display maternal affection. On the other hand, men are not so well favored in regard to occupational sublimations but are permitted by social custom greater opportunities to seek the company of the opposite sex. Probably the greater freedom given men in this respect compensates for their lack of occupational sublimations.

Just as in other of these forms of adjustment, sublimations may at times prove inadequate, leaving the individual still frustrated and partly unrelieved of thwarted tensions. The man who sublimates his rage by storming out of the family quarrel to chop wood may still, after vigorous exercise, feel that he has suffered an injustice. Or the unattractive spinster, in spite of showering affection on her lap dogs and canaries, may continue to experience

periods of frustration. In these instances the only apparent solution is more of the same kind of sublimating behavior within the limits of social approval.

Happily, mankind is richly endowed with a wide variety of possible response systems, and Western civilization, as already mentioned, has supplied many avenues of action, so that it is not an insurmountable task to find several possible forms of socially approved behavior that may serve as sublimations. Writing love lyrics, participating in aesthetic dancing, composing ballads, or even cabinet-making, photography, and model-building, have been suggested as satisfactory sublimations for the sex drive. Within the wide range of vocations and avocations suitable substitutes for relief of tensions created by the taboos of society can be found.

### *Seclusiveness, Daydreaming, Retreats from Conflict*

Persons sometimes find temporary relief from thwarted drives or conflicting impulses through retreat. The man who is disturbed by financial difficulties may resort to alcohol so that in his drunken stupor he may forget temporarily the plight of his family or the impending ruin of his credit. One woman found escape from the drudgery of her miserable home and shiftless husband by attending the movies every day. Others who have failed to attain satisfactions in the everyday competition of normal living retreat to the satisfactions conjured up in fanciful daydreams. There in imagination the thwarted lover sees himself rescuing a beautiful girl after her canoe has capsized in the rapids just above the waterfall. Unmindful of his own safety and confident of his strength he plunges into the torrent, grasps her firmly to him, and strikes for shore. Safely on land again he discovers she is not only beautiful but an heiress to a large fortune. The end to the imaginary drama is obvious.

Factors contributing to seclusiveness are without end. Parents may train a child to avoid contacts with neighboring children out of an exaggerated emphasis on good health or good breeding. Poverty may create feelings of inferiority, thus inhibiting association with other children. Wealth may likewise interfere with the normal development of social behavior if the youngster is sur-

rounded only by governesses or companions older than himself. One child began his daydreaming and love of seclusion when he was repeatedly sent to the attic as punishment. There he found spiders and wasps who became the subjects of his "kingdom"—the Attic Empire. He took such a delight in his reverie that he frequently went up to the attic voluntarily to play king. Physical defects prohibiting normal activity or mastery in athletics may lead to pronounced retirement from even those forms of physical action that are possible. The list of contributing factors could be continued almost indefinitely.

The following report points out at least one of the dangers in continued use of retreats, and particularly daydreaming, as a temporary solution to conflict.

My most dangerous, but at times most integrating, maladjustment is daydreaming. If things go wrong, if I can't sleep, if I'm worried, if my feelings are hurt, I am likely to take refuge in this escape reaction; and presto! my mental balance is restored. In my imaginary flights I have vicariously lived dozens of lives, at times wisely, on other occasions to my detriment. My realm of fantasy is not limited. To illustrate: Sometimes in my daydreaming I occupy positions of wealth and power, sometimes I am in the depths of poverty, while at other times I am moderately well off. It is so easy to enjoy things as they might have been or might be; but unfortunately, reverie makes me lazy. Why bother to work and strive, when a whole world of experience and emotion is open to me just by letting my mind drift? It is really fascinating, too, to start with one little idea and with no apparent effort to live through absorbing adventures. I am afraid this insidious maladjustment is going to thwart the one ruling ambition of my life—to do some lasting good in this world, which will not be forgotten when I'm dead. I don't have half the horror of death that I do of the oblivion that follows it.

The cause of this reverie is not quite clear in my mind, but I believe it is due to an excessive interest in fairy tales, coupled with the fear of being in bed alone. My mother did not start putting me to bed by myself until I was three or four. I remember I used to cry and cry, but mother soon learned to ignore this. When I learned that no one was going to pay attention to me, I would try to forget the shadow "rawheads and bloody-bones"—creatures who snatched away naughty little girls—by telling little stories to myself and pretending that I was the hero or heroine.<sup>8</sup>

As the author of this report suggests, the real danger in the persistent practice of daydreaming or other escape reactions lies in the fact that they are often substitutes for real achievement. In the end thwarting conditions have not been changed, problems inducing retreat have not been solved. Nothing has actually been accomplished except the postponement of some satisfactory solution to the underlying causes of daydreaming itself. In extreme cases retreat into a world of fantasy results in schizophrenia in which the individual may have delusions of his own grandeur, infallibility, and righteousness. He confuses imagination with reality to the extent of hearing sounds in the still air, seeing visions on a blank wall, tasting ice cream in a forkful of mashed potatoes. Using daydreams as substitutes for effective social action is an unhealthy mental exercise.

#### 4. FACTORS CONTRIBUTING TO MENTAL ILLNESS

A catalog of all the factors contributing to mental health or illness would require a large book in itself. An outline of some of the most important considerations is all that can be given here. It is convenient to divide contributing factors into two groups: those that are predisposing and those that are exciting or immediate. The predisposing factors are such things as the individual's environment, his physical condition, and family background, all of which may be remotely related to his mental health, forming the soil from which an illness may develop. The exciting causes are legion. Pursuing the analogy, they are the particular conditions which cause the seeds of mental illness to sprout. The major predisposing factors will be considered first.

##### *Rural vs. Urban Environments*

Within recent years evidence has accumulated to show that urban communities are overrepresented in institutions for mental disorders. Only 3.9 per cent of the first admissions to institutions in Massachusetts were from rural areas, whereas the population for the state is 7.6 per cent rural.<sup>9</sup> Other sources indicate that the urban rate of admissions for the United States as a whole is about twice as high as the rural rate.<sup>10</sup> Moreover, disorders having the highest incidence in patients coming from rural environments are those

associated with the well-known wearing-out processes occurring in middle or old age, conditions relatively unaffected by environment.

Dovetailing with these findings, the same study revealed that patients from urban centers showed a high incidence of disorders attributable to alcohol, drugs, and syphilitic infection.

The meaning of these figures is quite clear. Urban life is characterized by greater opportunities for conflict. There are more possible lines of action at any given moment. The terrific forces of commercial advertising and other stimuli are more potent, creating a greater number of desires, many of which are in conflict with each other. A population faced with these unresolved conflicts may resort to alcohol or drugs or promiscuous sexual indulgence to obtain temporary relief. Of course, the ease of obtaining relief in these ways may in part account for the differences noted between rural and urban areas.

An allied investigation revealed the influence of special urban conditions on the incidence of mental disorders. The residences of all patients in the mental hospitals serving Chicago and Providence were plotted on maps of those cities.<sup>11</sup> Very surprising was the finding that patients characterized by reasonably well-systematized delusions, suspicions, and withdrawn personalities (paranoid schizophrenia), were generally from the rooming-house districts of the city. On the other hand, those with manic-depressive psychosis (these are of three types: recurrent maniacal states, recurrent depressions, or cycles of maniacal and depressed conditions) came generally from areas of higher rentals. Both of these mental disorders are generally considered to be independent of any definite neurological or physical pathology, and consequently are most probably the result of poor mental hygiene.

The authors of this latter study suggest that the social environment may or may not be conducive to good mental health. Specifically, rooming-house districts, while physically crowded, are actually areas of great social isolation. Individuals live by themselves, hardly acquainted with the people across the hall. Seclusiveness is the key trait of the schizophrenic, a trait that seems to be exaggerated by the social isolation of rooming-house districts. It is further suggested that manic-depressive states are precipitated by the inter-

play of personality and psychological factors of family life rather than by the community situation. This hypothesis fairly well explains the observed differences in the geographical distribution of these specific disorders.<sup>12</sup> It is certainly reasonable to expect that just as unsanitary, fly-infested areas are deleterious to physical health, so certain areas may be infested with psychological conditions that make for greater conflict and more difficult adjustments.

### *Physique*

From time to time interest has been aroused in the possible connection between physical build and personality. Kretschmer some years ago distinguished between two principal types of body stature and found some association between these types and the diagnoses of mentally deranged patients. The asthenic type was described as having a slender but wiry body, prominent muscles or bones, and an angular profile. The pyknic was characterized by stoutness, short neck, full face, and rounded limbs. Upon examining and classifying 260 patients Kretschmer found the pyknics were generally manic-depressives while the asthenics were usually schizophrenics. However, subsequent investigations with more careful measuring devices have failed to substantiate Kretschmer's findings.

The search for a reliable relationship between bodybuild and personality has received new impetus in the work of Sheldon.<sup>13</sup> His system of classifying physiques is based on the assumption of three components which are found in varying degrees and combinations in all people. The first component, endomorphy, means a relative predominance of soft roundness throughout the body. The second component is mesomorphy, or a relative predominance of muscle, bone, and connective tissue. Extreme mesomorphics are the conventional stereotyped athletes. Ectomorphy is the third component, referring to relative predominance of linearity and fragility. Extremely thin, bony people possess a large amount of the third component. Sheldon's study of more than four thousand photographs has shown that within some individuals various parts of the body possess these components to differing degrees. Dysplasia refers to this aspect of disharmony within the same

physique. A body has a high degree of dysplasia when the head and neck, for example, are high in the first component but when the legs and trunk are high in another component.

Sheldon has found after photographing about three thousand young schizophrenics and three hundred manic-depressives that dysplasia seems to be more characteristic of the schizophrenics than the general population. Certain specific "dysplasias" also appear to be unusually frequent among particular kinds of schizophrenics. It may be that this new system of classification, at present still in the preliminary stages, will prove of more significance than Kretschmer's. We may hazard the guess that marked dysplasia may cause the individual to retreat from social contacts and lead a secluded existence because he is embarrassed by the abnormal proportions of his figure.

### *General Health and Well-Being*

The relation of physical health to mental health is an exceedingly complex one, which in many respects still remains a mystery. Does the mind affect the body, or the body the mind? This philosophical question of great antiquity has staunch adherents on each side. Many hygienists have taken a third position, maintaining that the organism must always be considered as a unit—the mind and the body being interdependent characteristics of that unit. There is no particular advantage in making a clear-cut artificial distinction between mental and physical events. Both frequently appear to be causes and effects. From this theoretical standpoint it is obviously important to consider, rather than ignore, general health as it is related to mental well-being.

One is reminded of the phenomena ordinarily discussed in general psychology concerning the physiological accompaniments of emotion. More than a hundred years ago a general practitioner, Dr. Beaumont, observing a patient with a gunshot wound in his stomach, noticed changes in the gastric juices, and retarded movements of the stomach when the patient experienced emotion. Similarly, another person noticed that excitement while anticipating a radio-network appearance may frequently be accompanied by diarrhea. Opposed to this is the constipation resulting from the horror experienced by the victim of a railroad accident.



Other specific physiological responses in emotion are discussed in greater detail in Chapter XVI, "Detecting Deception." The emphasis here is that bodily conditions are profoundly disturbed by emotions and attitudes.

Not only do intense experiences affect vital processes but special handicaps may be the source of much embarrassment, coloring one's entire attitude toward work, social contacts, and recreation. The following account is illustrative of some of the minor maladjustments, stimulated by a physical handicap, which may lead to more serious trouble if not corrected.

I became slightly deaf the year of my graduation from normal school. At the present time I can understand ordinary conversation if the speaker is near me and expresses himself plainly. I cannot always hear children across the room, nor can I readily locate noises or voices.

As a result of my impaired hearing I gradually developed an inferiority complex. I became sensitive, retiring, and sullen, and spent most of my time brooding and moping. As time passed, I shrank more and more from social contacts; I accepted few invitations, avoided people in general, and constantly tried to conceal my defect.

Having decided early in life to teach, I could not easily switch to another field. The realization that I would probably not be given a diploma if the faculty members discovered my predicament, started my tactics of concealment. I devised all sorts of little tricks for "getting by" the instructors without exposing my deafness. Although I made good grades, it was at the cost of great nerve strain. All went fairly well until I reached the stage of practice teaching. There was no side-stepping this apparently hopeless and impossible task. Surprisingly, the critic teacher rated me high and did not even discover my handicap. The fact that the section was small was in my favor, but the secret of success in this task lay in my ability to work and plan. I arranged my lessons so as to avoid discussions and confusions. This is one of the little arts that the deaf acquire. Overcoming a handicap is similar to overcoming a superstition. At first you are afraid of a superstition, then you defy it, and then you discover that nothing happens.

After graduation I was recommended as an elementary teacher in a large city school system. I cannot express to you my feeling of despair upon arriving in that city, nor describe the many heartaches experienced during my first year of teaching. Besides classroom problems, there were teachers, supervisors, and parents to be faced. I wanted to shrink from

them all, and resorted to the old trick of concealment. Becoming desperate, I finally took a course in lip reading. While the course did me very little good, my association with the hard-of-hearing was a real inspiration. I found that they thought nothing of their affliction, but joked about it as if it were any ordinary physical ailment. It was during this period that I decided to admit that I was deafened, to face the issue squarely, and to take the consequences. To my surprise, I grew much happier. I began to realize that by trying to deceive others I had merely deceived myself, and had built up a barrier which shut me off from people. This discovery made me feel more at ease. My fear of being found out was gone and that gave me courage.

Having assumed a more wholesome attitude toward deafness, my philosophy of life changed. I cultivated attitudes of optimism, confidence, helpfulness, sincerity, and intellectual and emotional poise.<sup>14</sup>

One can readily see in this case the mechanism of adjustment in operation as it was discussed in the preceding pages. The onset of deafness blocked the normal line of action to the goal of becoming a teacher. The woman retreated as much as possible from situations where deafness would be evident, but in the classroom where retreat was impossible she devised an effective and successful solution. The classroom "dodge," however, gave only a partial or temporary satisfaction. Her action in taking the lip-reading course represented a direct attack on her problem, resulting in benefits from an unexpected source.

In this case, as in virtually all others, a satisfactory resolution of the conflict comes when the basic problem is clearly recognized and positive steps are taken to reduce the importance of the blocking conditions.

Cases of similar nature, but with varying solutions, involving other sorts of physical conditions, could be recited. Occasionally, physical defects are aggravated by ensuing worry, anxiety, or fear, thus setting up a closed cycle of emotional and physical conditions that becomes progressively worse.

This salesman, 58 years of age, was referred to a department store's psychiatrist because of numerous complaints and much worry about himself. He went to the store's infirmary frequently and often reported fears of dying in one of his attacks.

Examination of the man revealed normal intelligence but some indication of premature senility. He reported a number of symptoms,

including feelings of weakness during which his extremities became cold and clammy, palpitation of the heart, difficulty in breathing, trembling, and feelings of gastric distress. He complained of inability to relax, general restlessness, and a fear that his heart would stop beating during his sleep. He kept a bottle of aromatic spirits of ammonia by his bed at all times. His emotional tone was constantly depressed.

Fundamentally, this man was afraid he would have a nervous and physical collapse, rendering him unable to support his invalid wife and two children. His preoccupation with that basic fear, in part supported by a previous illness causing an operation for gall stones, undoubtedly precipitated his major difficulties. These in turn served to aggravate his poor physical condition, thus fortifying his fears of ultimate collapse.

The final outcome of this case is not available because his condition failed to improve under the treatment of the store's psychiatrist. It was recommended that he be laid off and outdoor employment be found for him.<sup>15</sup>

Persons unusually sensitive about their physical health unwittingly add to their minor illnesses by unproductive, useless anxiety. "To be healthy," said one physician, "good elimination is necessary, but this means the discharge of bad mental attitudes and emotionalism more than fetid physical substance."

### *Heredity*

Heredity has been the scapegoat for a great many of the ills of mankind. At one time nearly all mental disorders were considered attributable to the uncontrollable workings of inheritance. No doubt this belief may have accounted for the slowness with which preventive and curative measures have developed. No one could reasonably expect psychiatrists to cure or prevent mental ill health if it were the result of the sins of previous generations. Within the past three decades, the belief has steadily grown that heredity exerts a relatively minor influence on the mature personality. Important determiners of later mental stability are being found more and more frequently in the training and experiences of early childhood.

The primary evidence submitted to support the theory of hereditary determination of personality comes from the study of certain infamous families. One of these, the Jukes family, has been traced back to the eighteenth century to two allegedly feeble-minded

sisters. The family tree includes a total of 2044 descendants, of whom only 171 have been described as industrious. Of the rest 107 were mentally defective, 181 were drunkards, and 378 were prostitutes. Studies of this sort cannot be used with justification to demonstrate biological inheritance of personality since the environments of all descendants were defective. To prove the theory, studies are needed of children of known heredity subjected to training in various kinds of cultural influences, and complementary investigations of children differing in family background but reared under nearly identical conditions.

However, it is futile to declare that heredity is without any influence on personality. Its influences in this regard are largely indirect. That is to say, heredity determines the limits within which most physical characteristics may be modified by environmental factors. These physical features are susceptibility to certain diseases, height, weight, eye-, hair-, and skin-color, baldness, quality of hair, and a number of special physical diseases such as color-blindness and hemophilia. These physical or bodily factors may, of course, affect mental health, depending upon the attitudes assumed by the individual toward them. In this way inheritance may indirectly affect mental health.

Specific habits, attitudes, or desires, such as alcoholism, general nervousness, temper tantrums, pessimistic outlook on life, and such, are not biologically transmitted from parent to offspring. When such personality traits appear in successive generations their occurrence is adequately explained by reference to the important influences of cultural factors operating throughout the early years when children easily assimilate the mannerisms, customs, likes and prejudices of their immediate associates.

The effect of defective heredity is, therefore, indirect. It may provide predisposing factors or render an individual somewhat more susceptible to mental disorder, but it is in no sense an immutable factor.

In this section are reviewed some of the salient predisposing factors contributing to mental illness. Urban life seems to be more conducive to poor mental health than rural life; a certain disharmony in physique is found more frequently in certain kinds of mental disorders than in the normal population. Physical handicaps and

defects may be the source of some thwarting of normal drives, thus predisposing the individual to greater adjustment difficulties. Finally, defective heredity is no longer considered of great influence in determining personality patterns but it may be of indirect significance to mental health through its determination of body build, general health, and particular physical defects.

## 5. EXCITING FACTORS

The exciting factors that "touch off" a mental breakdown constitute an endless list. The death of a close relative, a pregnancy, a period of prolonged intense work, financial reverses, loss of reputation, disappointment in love—all of these and a great many more are events which may be the spark to set off a string of behavior sequences that quickly culminate in a "nervous breakdown." In practice it may be difficult to disentangle the predisposing and exciting causes. For example, a normal-school graduate with three or four years teaching experience married a man who later proved incompetent to manage their small farm. The wife tried by every legitimate means to prod her slovenly husband into greater effort but in spite of all she could do the farm fell into disrepair. As she expressed it herself, she did not mind so much when the barn door fell off, or when the chickens got through the fence into her garden, but the day she slipped on a broken step and the pig later got through the rusted screen door into her kitchen was too much. In this instance the string of events leading up to her maniacal state extended over a period of years, each one sapping her resistance until she could stand it no longer. A study of her case history revealed other conditions prior to her marriage that were probably predisposing.

### *Specific Factors Causing Minor Maladjustments*

Some people are bothered by aversions, fears, or special disabilities that at first seem groundless. Unusual food dislikes, fear of animals, high places, enclosed areas, some cases of reading and spelling deficiencies, are traceable to particular experiences often occurring in childhood. Sometimes the source of these difficulties is largely forgotten but the maladjustment persists until the memory of the early experiences is revived and a new attitude is assumed.

The following cases are illustrative of the range of conditions giving rise to minor maladjustments of this kind.

I have not been able to stand the sight of orange juice and much less drink it since this time last year. At that time I had an emergency operation for appendicitis. About 24 hours after the operation the first food the nurse offered me was a glass of orange juice. This made me terribly sick and I vomited for some time. For two days I could not retain water or anything else. On the third night one of the internes and several nurses came in with what seemed to me several miles of slimy rubber tubes and gallons of soapy water. In my nauseated condition it took three attempts to get me to swallow the tube. My arms and legs became numb and for the first time I really became frightened. After the terrible ordeal was over they told me I would be able to retain food the next day. But the next morning the sight of orange juice started me vomiting again. During the next few days I built up a tolerance for a soft diet, but I refused to try the orange juice. Until this day the sight of orange juice makes me think of slimy tubes and I am unable to drink it, although I can drink other fruit juices.<sup>16</sup>

At the age of seven, while in my second grade, I was out of school for a month because of an ear infection. On my return to school the teacher was explaining addition. Because of my failure to answer a question she hit my fingers with a ruler. Little did she realize what an intense dislike for arithmetic she aroused in me. I continued my dislike for every phase of arithmetic until I was in the eighth grade, when I was thirteen and had a teacher who thoroughly enjoyed teaching arithmetic. Although she helped me overcome some of my aversion to arithmetic, I have never been able wholly to overcome it, especially so far as it concerns addition. I often find myself trying my hardest to evade giving my children instruction in addition. Arithmetic has become the most difficult thing for me to teach.<sup>17</sup>

I am exceedingly afraid of lightning. During the summer months I am seldom at ease for I know that before long we will have a thunder storm. When the storms come after dark, I try to block out the lightning by pulling down all the shades and turning on the lights. It is only with difficulty that I can eat a meal through even a mild storm. The source of this fear goes back to the time in my early childhood when my grandmother used to take me into the "Sunday parlor" every time a thunder-storm came up. There we would sit in the semi-darkness, most of the time with our heads under pillows. She never said much but I could see she was afraid. Then after I had graduated from college and was working

in an office, an unusually severe storm came up. The lightning was terrific. One bolt burned out two of our telephones and another damaged our electric adding machine. Everyone in the office was frightened that day but I was jittery for hours after. I have tried for a long time to overcome my fear but without much success. Now that I have a daughter of my own, I am more determined than ever to control my fear so that she will not be affected as I am.

When I was about four years old, my mother used to leave me occasionally with my brother, who was nine years older. He did not like to be bothered with me when he had something else to do, so he would pass the time by teasing me. One of his pet methods was to play "Old Black Joe" on the victrola while I was in a dark room on the second floor. Every time the old colored man sang, "I'se comin'," I could just see and hear him coming up the stairs. As soon as I imagined him coming after me I would hide my head under the covers and keep it there until I finally fell asleep or my mother returned.

I remember particularly one Christmas Eve when my mother and brother returned from midnight church and allowed me to get up to see my toys. Just as I reached the bottom step my brother started "Old Black Joe" on the victrola. When I looked up, there stood the old colored janitor from our church. I screamed, ran up the stairs, and refused to come down until the following morning when I was sure that everyone would be sleeping.

After that, whenever I would hear the selection, I would either leave the room or, if that was impossible, sit and cry. This continued all the way through school and for two years after I finished college. Now, although I do not cry or leave the room when the selection is played, I must admit that I still do not like it. I am just as well pleased when I am not forced to listen to it.<sup>18</sup>

How do people develop poor mental health? When adjustments to thwarting conditions fail to result in reasonably permanent and complete relief from tension, the individual is likely to dissipate his energies. The chief factors predisposing to poor mental health are urban communities, poor physical health, unusual physique, and defective social as opposed to biological inheritance. In addition to these predisposing factors, a limitless array of exciting or precipitating factors operate much as the proverbial "last straw" to push the individual below the zone of minor maladjustments into the area of distinct neurosis, requiring professional treat-

ment. Many minor maladjustments are traceable to particular experiences that are highly charged emotionally.

## 6. SOME COMMON SYMPTOMS OF MALADJUSTMENT

The preceding discussion was concerned with some of the signs indicative of poor adjustments and a psychological standard by which one can judge whether or not a given adjustment is conducive to mental well-being. It now remains to bring together in an orderly fashion some of the common reactions that fail to relieve conflicting tensions.

### *Anxiety, Worry, Indecisiveness*

When an individual is confronted with the necessity of choosing between two or more lines of action he may remain for an extended period in a state of suspended indecision. The situation is somewhat like the donkey standing between two haystacks, who starves to death while making up his mind which to eat first. In many such instances the period of vacillation is marked by worry, feelings of inadequacy, inferiority, and anxiety. Occasionally other factors enter the picture beyond the individual's control, simplifying his choice. Consider the following example:

I find myself afflicted with an inability to enter into competition of any sort, whether in games, scholarship contests, or what not. The fact that I am aware of proficiency along the line of the contest has no bearing whatsoever on the matter of my inability. For example: I am a pretty fair bridge player and know that I am. I thoroughly enjoy playing a "friendly game" with two or three boon companions, but let anyone "throw a party" with prizes and I am completely lost. My hands tremble, my mind will not work, and I forget the simplest rules of the game.

I may know the subject matter on which a test is to be given ever so well, but the test becomes a "nightmare" of trembling hands, blank mind, and difficulty in seeing.<sup>19</sup>

Or this from a divorced schoolteacher and daughter of a widowed minister, who was coddled and pampered even through her married life:

I have suffered under the handicap of procrastination almost as long as I can remember. But I just considered it one of the human ills that flesh is heir to, hence did nothing about it and continued to suffer.



I have lost money, time, friends, credit for work done, and precious opportunities, because of my seeming indifference. At the same time I have suffered untold remorse because of it.

I have had people owe me money but have put off the collection so long that I have been ashamed to ask for it.

I have failed to write friends or relatives even the one letter courtesy required after a visit at their homes, and I have been ashamed to face them when we would meet the next time.

I have bought things at stores and kept them for a month at a time before making an exchange and then to cover up my embarrassment, have deliberately lied by saying I had been out of town or had been ill.

Almost every month I have failed to pay my gas and electric bills until past the time limit, although I have known that every time I do this I will suffer a three percent penalty.

While taking this course I have read article after article and cut clipping after clipping that had a direct bearing on the lesson, but invariably put off making any mention of it.<sup>20</sup>

In extreme forms the individual simply sits and stares at the passing world in an apparently serene frame of mind, but beneath the disguised exterior one often finds a seething storm of conflict. Such persons are sometimes judged stupid or unconcerned. Usually they distrust their own competency and doubts arise regarding the outcome of their efforts. A chronic inability to make decisions, and the consequent anxiety is a sign of maladjustment.

### *Unnecessary Fears*

The emotion of fear and tendencies to withdraw from certain dangerous situations are sometimes desirable forms of behavior of inestimable service. However, some people find themselves caught in the throes of irrational, useless fears that interfere with their normal activities. Probably no other single form of maladjustment is so prevalent as are the peculiar fears which are shamefully guarded and hidden by subtle disguises. Their origin is frequently found in some early childhood experience, highly charged with emotion. Often the original experience is forgotten, but the fear of eyes, of snakes, of high places, of closed places, of subways, of imminent death, of being caught from behind, of running water, and a thousand other things persists to confound, discourage, and confuse their victims.

Until recently I have frequently been afraid of smothering or suffocating while in small rooms or narrow hallways. The fear was probably brought on by playing with a group of small children. Our game necessitated covering our entire bodies from head to foot in blankets. In the game I was knocked down and all the children piled upon me. Only the timely intervention of my mother prevented my suffocation.<sup>21</sup>

Sometimes the fears disappear for a time, only to recur later in life with exaggerated force.

One man remembers that when he was twelve years old he became terrified by crowds of people—so much so that he could not bear to remain in large congregations at church and once interrupted the service by making a hasty exit. The fear disappeared, however, until he was nearly through college, when he was suddenly overwhelmed with fear one day in the confusing crowd of a big football game. Thereafter he found it difficult to visit any large city where the business streets were crowded; he could not bear to enter or remain in a building containing an assembled multitude. He had to give up eating in restaurants and riding in day coaches because of feelings of terror aroused by these situations.<sup>22</sup>

Peculiar ramifications may develop from an early frightening experience, as illustrated in the following case:

Mildred K. had an intense fear of eyes. She never looked at anyone directly, but always glanced away while talking. She explained that the sight of an eyeball caused her to feel an uncontrollable emotional panic. Mildred frequently had nightmares of persons whose eyes were horrible and staring. She also had a tendency to repeat the phrase, "Fear looking out of her eyes." On occasion she found herself saying this phrase subvocally over and over again, apparently unable to stop. As a result of her preoccupation with this fear she was unable to concentrate on her work, her academic standing was seriously impaired, and her social relationships were likewise suffering.

After a long period of consultation with a psychologist, she finally recalled making a visit at the age of seven to a blind aunt. Mildred on that occasion had set out to explore the house with some excitement and fear of being caught. Among other things she began peeping into the bureau drawers. As she opened one drawer, out of it stared two horrible eyes. The fact that they were glass eyes belonging to the blind aunt did not detract from the intense fear Mildred experienced as she fled in terror. Mildred never told anyone about that event until her consultation with the psychologist.<sup>23</sup>

Fears of this kind can sometimes be relieved by the recall and repeated recitation of the initial exciting experiences, with the intention of reevaluating their importance. In the case of Mildred, she came to look upon her childish explorations as somewhat less shameful than she had previously considered them, with the result that her fear of eyes greatly diminished.

### *Compulsions*

Compulsions are specific acts that are repeated at frequent intervals without apparent reason. Most people at some time or other have felt the need either to step on all the cracks in the sidewalk or to avoid all the cracks. Samuel Johnson's tendency to tap all the fence posts, pickets, and trees with his cane as he passed is an example of a compulsion. Lady Macbeth's repeated hand washing is a similar mechanism.

These forms of action are closely related to fears in that both are frequently traceable to the same kind of early unfortunate experiences. Sometimes the compulsions and fears are intertwined, as in the case of Mildred, who persisted in repeating a certain phrase. A compulsion from one angle is perhaps a better adjustment than a simple fear or anxiety reaction since it serves to burn up some of the unused energy blocked by the basic conflict. In this manner tensions are temporarily relieved.

Pulling out a cigarette and smoking it when conversing with people is a compulsion with me. I do not smoke because I enjoy the taste of cigarettes, but because it aids me in acquiring poise. It aids me to think clearly, talk more fluently, and to have fewer inhibitions.

I did not touch a cigarette until I was nineteen years of age, in the last year of high school. The principal of the school prohibited smoking. The group of young men who were my associates and who were a little older smoked, and the other high school students smoked on the sly. In order to show them that I also was a man, I started to smoke. When I first put a cigarette in my mouth I did not like the taste of it, but it gave me a feeling of manliness, a feeling of superiority, a feeling of equality with my associates. With a cigarette in my hand I felt equal to any one, and lost my feeling of self-consciousness.

My reactions are just the same yet. If I am self-conscious in a group I can "be myself" if I have a cigarette. In the presence of someone whom I feel submissive to or inferior to, I automatically reach for a cigarette

without thinking of its effects on me, yet when I analyze it I notice that it does have a great effect. It seems that because this happened the first time I smoked a cigarette, the mental effects still persist.<sup>24</sup>

In themselves, many compulsions are harmless inconsequential habits. They may become the center of worries or anxiety if the victim does not understand their nature or if he is made to appear queer by their execution. In one small town an elderly woman had a compulsion to walk around certain trees on the street from her home to the shopping district. This peculiar habit was not serious in itself but was the basis for her reputation of being odd and "not quite right in the head." Consequently her social relationships suffered.

Like the irrational fears just discussed, compulsions can sometimes be relieved by a careful analysis, probing into the individual's past to revive early experiences. In a great many cases the bare mechanism of a compulsion fits the following formula: the victim has some very intense emotional experience which he tries to keep secret, either because the experience itself is taboo or because it may reveal to others some undesirable aspect of his own personality. The tensions created by this attempt at secrecy are temporarily relieved by some act that very shortly becomes stereotyped and habitual whenever conditions are such as to remind the individual of his original exciting experience.

Of course, this formula does not explain the development of all compulsions. Some are the outgrowth of superstitions. One woman always expectorated after urinating because of an ancient belief that such an act brought good luck. "Step on the cracks and you will break your mother's back," was the phrase that induced one boy to avoid stepping on the lines in the sidewalk. These compulsions very quickly disappear after the individual is convinced of the superstition's falsity.

### *Emotional Immaturity*

A normal healthy child is easily distracted; he moves from one plaything to another; his pleasures and sorrows are fleeting; his sense of values is immature; when asked to do something contrary to his wishes he resorts to temper tantrums or becomes sullenly stubborn; his patience is short; long-term promises produce in him

irritation; he easily loses emotional control; much of his conversation is about himself; and most of his actions are designed to give himself greater pleasure or happiness; he is ego-centered.

Some adults never really mature emotionally. They continue to meet their critical problems of adulthood with the devices appropriate to children. They fly into uncontrolled rage on the slightest provocation; their patience is short, and they often excuse themselves by pointing to the importance of quick decisions and forthright action. They are given to pouting or spiteful actions. One man was dissuaded by the pressure of neighborhood opinion from selling a portion of his own building lot because it was felt the house proposed for the lot would make the area too crowded and cut off the view of neighbors. His first reaction was to threaten to plant large trees or build a larger house than originally planned. Another instance of emotional immaturity is found in the woman with an insatiable appetite for attention but unfortunately endowed with neither good looks nor good brains. Shortly after her marriage she demanded a home and servants beyond the level of her husband's income. When he failed financially she separated from him, returning to her father's home. Later a reconciliation was affected largely in the interest of a four-year-old son. Five years later she was less interested in a large home but more interested in finding the precise hat to harmonize with her "type." Her day was consumed in dressing, eating, and beauty treatments. She remarked quite frankly that she loved nothing better than to have a girl fuss with her hair, bring her magazines, and apply a "facial." She took no interest in her husband's work and seemed utterly unconcerned with her son. The center of her interests had retreated from her home to herself. She had retreated from her husband to her father to herself.

Dr. Karl Menninger had some of his students report the childish traits they had detected in themselves. Here is a condensed list:

"I love to look at myself in the mirror."

"I want things badly and when I get them, I don't want them any more."

"I'm always wishing I were someone else."

"I always get what I want even if I have to shed barrels of tears."

"I laugh when the joke is on someone else; when it is on me, I pout."

"I like to be begged and coaxed into things."

"I like flattery. Nothing makes me so happy as to have someone 'feed me a line' about almost anything."

"Sometimes I do things just because somebody else doesn't want me to."<sup>25</sup>

Like the other signs of mental ill health discussed in this section, childish emotionalism usually fails to resolve conflicts. The few occasions in which pouting or temper tantrums or self-centered actions do result in temporary satisfactions leave the individual no more capable to discover for himself more mature lines of action. He remains dependent upon his parents or parent-substitutes who are the ones really responsible for relieving his tensions. Only when he develops for himself clear conceptions of his problems and discovers ways of manipulating his own behavior or the thwarting situation so as to achieve relatively permanent satisfactions, can the individual be considered emotionally mature.

### *Simulation of Physical Ailments*

Among the more dramatic evidences of the influence exerted by mental states on bodily conditions are the so-called conversion phenomena in which the individual finds partial escape from conflict situations by becoming physically ill. The energies dammed up by conflict are "converted" into physical deficiencies which serve in devious ways to dissipate the tensions. A very common example will make this clear.

Homesickness in varying degrees of seriousness is a rather common occurrence among college freshmen during their first weeks away from home. The condition may merely involve, at one extreme, a short period of loneliness, an exaggerated desire for mail, and perhaps feelings of anxiety concerning one's ability to complete the term. At the other extreme, homesickness may result in severe headaches, palpitation of the heart, lassitude, marked feelings of inadequacy, and even nausea. The physical symptoms, whether the patient admits it or not, appear to be designed to bring him attention, sympathy, and the kind of motherly pampering he received at home. Oftentimes the symptoms magically disappear when the parents visit the patient and may reappear when the parents leave. In cases of this sort the individual has a difficult

time in forming habits that make him independent of the affection, love, and parental attention formerly received. The physical symptoms promise to regain for him his former position in the family circle.

In extreme situations the physical disabilities produced by mental conflict take dramatic turns. During World War I and II a great many soldiers suffered from shell shock—some who came no closer to an exploding shell than ten miles! Contrary to some popular opinion, the concussion of an explosion usually has little to do with the production of shell shock. Basically, the soldier is caught between two very potent drives: his desire to do his duty and the equally important desire to avoid injury or death. By acquiring some physical handicap, thereby being removed to a hospital, he is temporarily relieved from personal risk and yet has done his utmost for his country. The correctness of this explanation is found in the records of many of these shell-shocked cases who recovered almost immediately after the armistice was declared. Soldiers who were blind, deaf, paralyzed, or otherwise unfit for active duty, suddenly became well again as soon as one of the conflicting drives was relieved.

A case is reported of a workman who attempted to throw an electric switch which was reputed to carry several thousand volts. In some way he believed that he had received a shock such that the electricity had gone through his left leg and left hand. However, after the accident he walked about half a mile, got into a friend's car, and was taken home. All at once he discovered he could not use his left leg. There was a rapid heart, pains in various parts of his body, and loss of sensation on the left side.

For two months he was absolutely bedfast, unable to empty his bladder unassisted, completely paralyzed in his left leg and thigh. Some months afterward he walked with the aid of crutches and a very expensive brace. At the time of his examination by a psychiatrist he had been paralyzed for over a year, was very depressed, and discouraged because the allowance made by the company was insufficient to support his family in comfort. As he described his theory to the examiner, he believed the electricity had destroyed a nerve in his leg. Since it had occurred in the course of his duties he was entitled to compensation. He was asking \$50,000.

A number of facts were unearthed that led to a diagnosis of "industrial shell shock." In the first place, the switch did not carry as much current as the workman had supposed. Second, it was well protected so that it was almost impossible for the man to have received a shock from it. Third, electricity may burn flesh but it does not paralyze nerves. Fourth, if the nerves had been injured he would have suffered a flaccid paralysis in which the limb lies inert and loose, all tendon reflexes being absent—conditions not present in the patient. Finally, the kind of paralysis claimed by the workman is always accompanied by some shrinking of the muscles, but careful measurement showed no such shrinking. The case obviously represented a pseudo-injury which served to relieve the man of arduous work while still being supported.

He was later awarded \$3,500 and subsequently was reported to be perfectly well.<sup>26</sup>

Conditions of this sort are not to be considered direct attempts at deceit. Rather, the individual himself is as much fooled as anyone. The symptoms are just as real and painful as those having a physical origin. The essential difference between a physical blindness and one caused by conflict lies in their remedial treatment. In the latter the basic conflict must be found by special means and then ways devised of reducing the tensions.

The symptoms of poor mental health have not been exhausted in this discussion. Just as medical science is constantly unearthing additional signs of approaching illness and making finer and finer discriminations between diseases, so in the field of mental hygiene more concise definitions of symptoms may be expected. It is fortunate that profound mental distortions do not inevitably follow on the heels of the symptoms just discussed. They are, however, danger signals which may be warnings of more serious trouble if ignored or unwittingly cultivated.

## 7. SUMMARY

This chapter dealt with the problems of adjustment to conditions that thwart satisfaction of drives. It has not been concerned with those mental disorders caused by physiological pathology nor with the extremely psychotic patients found in mental hospitals, except insofar as such conditions illustrate minor, but prevalent



maladjustments. Adjustment has been treated as the process whereby obstacles in the way of on-going automatic behavior are met. Adjustments are good when they culminate in a resolution of the conflicting forces for the longest possible time and develop the individual so that he is more capable of resolving future conflicts. In the light of this background some of the more common types of adjustments were discussed including compensation, rationalization, projection, sublimation, retreats from conflict. It has been found helpful to think of the causative factors in mental illness under at least two headings—predisposing and precipitating or exciting factors. The former include such considerations as rural vs. urban home, physique, general physical health, and hereditary background. The exciting factors are so numerous and varied that they defy strict classifications. The final section dealing with some of the common symptoms of maladjustment covered a discussion of worries, fears, compulsions, emotional immaturity, and the simulation of physical ailments.

## Chapter 4

### MENTAL HYGIENE AND GUIDANCE

Parent education is one of the most recent developments of importance in the educational world. Indeed, it has been described as "one of the most significant social experiments of our generation or one of the most disastrous."<sup>1</sup> It is significant because of the extent and rapid growth of interest in child study. Previous to the war at no time had so many people been directly or indirectly associated with some program pointed toward parent education. The "students" in these groups varied from the sixteen-year-old girl charged with keeping her younger brothers and sisters, to the foreign-born grandmother who had been induced to learn something about modern American child methods so she would not be a source of friction at home. Lecture and study groups on child training were found in every city, in many towns, and in 60 per cent of the rural counties of the nation.<sup>2</sup> It is expected that after the war this interest in parent education will again expand.

The movement is potentially disastrous because, in this area especially, a little knowledge is dangerous. Teachers and clinical psychologists alike testify that many of the most trying cases of problem children come from homes where the parents have had a little psychology or have read a single book on child training. Parents eager for information avidly swallow the words of this or that expert, but the teachings are rarely digested. Such parents, so to speak, learn the words but not the music. In consequence, their children prove to be unstable, disturbed by feelings of insecurity, the victims of contrary impulses.

The parent-education movement has been concerned with disseminating the best mental hygiene principles of childhood. The same objective has also gradually penetrated the professional train-

ing programs of teachers. Schools are no longer limited to the cultivation of intellectual skills but in addition have assumed at least partial responsibility for emotional, temperamental, social, moral, and sometimes religious development. The competent teacher is consequently charged not merely with the task of training John or Mary in arithmetic but must also consider the total personality of each student. Effective teaching, therefore, demands not only good preparation in subject matter but also requires an understanding of the dynamics of human behavior. The teacher of today occupies the position of a substitute parent in relation to the children in her class. As such, she must be trained to "treat" behavior problems according to the best available information.

This chapter will deal with some of the principles and techniques of child guidance. For the most part it will consider the problems of early childhood from the standpoint of parents, touching also on some of the problems of the preadolescent years. Prospective teachers will find in the following pages suggestions that apply not only in the home but in the classroom as well.

### 1. EFFECT OF ADULT ADJUSTMENTS ON CHILDREN

Clinical psychologists and others dealing daily with children who lie, steal, play truant, and are obstreperous in other ways, have often remarked that there are few real problem children but a great many problem parents. What they mean to emphasize by this statement is the fact that unresolved emotional conflicts in the parents or misguided but tenaciously held conceptions of guidance are often the root of the problem behavior exhibited by the children. The conviction has been growing that the best parents and teachers are not necessarily those who know the most about the physical, mental, and emotional growth of children, but those who are themselves well-adjusted and well-integrated persons.

The evidence for this belief is not confined to the opinions of psychologists or psychiatrists. Karlin, in her study of fifty neurotic children, found that the mothers of 67 per cent of the children were also neurotic; half the parents showed marital discord; the parent-child relationship was unwholesome in 75 per cent of the cases.<sup>3</sup> Another study examined the parental attitudes of two groups of children, one composed of liars, the other of nonliars. Ninety per

cent of the nonliars came from homes that were stable and harmonious, while 75 per cent of the liars suffered from inconsistent discipline at the hands of parents who were emotionally unstable.<sup>4</sup> When delinquents already in correctional institutions were compared with students of comparable age in public schools, it was found that the delinquents reported a greater number of family maladjustments than the nondelinquents.<sup>5</sup> Similar evidence comes from a great host of studies virtually without contradiction.

The implication of these findings for parent education is obvious. Self-knowledge and self-adjustment are basic essentials in parents and teachers if they are to discharge their obligations satisfactorily. The reader is referred particularly to the first objective of mental hygiene given on page 53 of the previous chapter. Parents, unhappily, are often unaware that their own emotional biases handicap the adjustment of their children in subtle ways. The mother who for one reason or another finds it difficult to adjust a Puritanical conception of sex to the normal relationships of married life may by devious suggestions implant the feeling in her daughter that any expression of this basic drive is wrong. Quite unwittingly, the daughter's future marital adjustments are thereby jeopardized. Just as the fears and loves of one generation are absorbed by the next in the casual contacts of family life, so insecurities and maladjustments are passed on.

In the formative years of the child's life the parents are developing a new set of habits. These are the habits associated with the parents' reaction to signs of disobedience, stubbornness, and the almost endless array of kindred problems common in all children. It is often easy for parents to meet aggressive disobedience with aggressive discipline. Or, others may fall into the "threatening habit" which soon loses its effectiveness unless the threats are consistently carried out. In any case, when disobedience occurs parents and teachers are prone to act instantly according to those habitual patterns which have developed in the course of their contact with the children.

As long as habitual forms of discipline remain effective to gain the ends desired, and as long as they contribute to the better adjustment of the child, they are to be cultivated. Usually, however, a given mode of discipline outlives its usefulness. Children grow

older; their forms of disobedience change; they mature into a greater capacity to assume responsibility. In consequence, the methods of control developed to take care of a two-year-old toddler cannot successfully be applied to a four-year runabout. Nevertheless, persisting habits, plus the inability of most parents to recognize their own deficiencies in the misbehavior of their children, lead many to continue with ineffective threats, scolding, or panicky restraint. Even granting that the initial methods of guidance were well adapted to the child, it is evident that parents must be vigilant to prevent their immediate response to behavior deviations from being rigid and unchanging as the child develops.

It is evident that the adjustment of children is first determined by the mental health of their parents and teachers, as well as the habitual forms of response they evoke in their parents.

## 2. WHAT ARE THE AIMS OF GUIDANCE?

What kind of children do parents want? How many have sat down and clearly formulated a description of the personality they would like for their own son or daughter? Parents and teachers are presumably guiding children toward some end, but few can tell in concise terms what that end is. For the most part, guidance procedures are oriented only to accomplish an immediate goal—to keep Johnny out of the newly planted garden or to get Isabel to eat her dinner. If these ends are accomplished the long term view is forgotten—if indeed it was ever thought of.

Thinking about the objectives of child training is complicated by a certain inconsistency in social values. In general, what is a “well-disciplined child?” Most will readily agree that a well-disciplined child is one who responds readily and correctly to wishes of adults; to demands *outside* himself. On the other hand, what is a “well-disciplined adult?” Again, most will agree that he is a person who has good self-control, who is well integrated without conflicting ambitions, and only rarely dominated by demands outside himself. In other words, standards of good behavior for children are the opposite of those for adults. In one case self-directed behavior is valued and in the other is ordinarily opposed.

The essential difficulty presented by these conflicting standards

lies in the inability to achieve both goals. If a child is guided throughout his preschool and early school years to yield to the decision of others he cannot readily develop in later life a new manner of meeting the world that demands independent decisions.

Recognizing this ultimate objective, many psychologists and child-training experts have permitted their own children a degree of self-determination and freedom that has shocked their neighbors. In the conventional sense these children have not been well disciplined. On the other hand, many of the best controlled children have later carried their decision-yielding behavior into adulthood to become the timorous, servile subordinates to self-reliant capable executives.

The positive aim of child guidance should be the development of a well-integrated personality exhibiting the characteristics of good mental health described in the previous chapter. To recapitulate briefly, the person in vigorous mental health has a clear insight into his own abilities and deficiencies, adjusts easily and readily to the changeables and unchangeables of living, has a well-regulated system of maintenance habits, is not an extremist in the satisfaction of any single drive, is socially agreeable, and derives primary satisfactions from his vocation. It is of paramount importance that parents and teachers constantly remind themselves of these aims and consider whether their methods of guidance are likely to achieve the goals. Many of the problems of guidance stem from the fact that few parents seriously consider the long-range objectives of guidance, being content to settle each of the daily problems in terms of immediate expediency.

### 3. PARENTAL ATTITUDES AFFECTING SATISFACTORY GUIDANCE

As one examines children referred to psychological clinics, studies their case histories, and talks with parents, it becomes evident that certain parental attitudes are inimical to the adjustment of children. Often parents are motivated by the best of intentions but through ignorance or superstition have slipped into a point of view that handicaps and thwarts the normal development of their children. Following are some attitudes that help and handicap adjustment.

*Overprotection*

Mothers are particularly prone to fall into the error of overprotection. It is significant that one of the joys of motherhood comes from the opportunities afforded to fondle and care for an infant. In the early months the very existence of the child depends upon the degree to which his every need is fulfilled. In the beginning the youngster is completely dependent upon others for his life. There are few more helpless living organisms than a new-born human. In satisfying her child's needs the mother ordinarily derives unique satisfaction.

As the child develops through the toddler stage into the nursery-school age and beyond, the need for immediate protection and care from adults slowly but surely wanes. It is perhaps natural that mothers who derived unusual satisfaction in caring for their infants should withhold the liberties and freedom the children are capable of handling at later ages. The full development of the child demands that he be permitted gradually more and more freedom of choice. In the early years of life he must, for his own good, be figuratively tied to his mother's apron strings, but those strings must always be lengthened until eventually they are severed. The deeply ingrained impulses of motherhood, fed by the pleasures derived from helping infants over the simple obstacles of living, oppose the emancipation of children from their dependence on parents. It is no surprise, therefore, that some fail to recognize the importance of gradually relinquishing parental controls as children mature.

The end results of overprotection are well illustrated in the case of George:

George's mother married rather young to a man much older than herself. Her husband was stolid, industrious, frugal, but a generally uninteresting plodder whom the family thought was fit for their daughter. It was more to satisfy her family than herself that George's mother married. When George was born the household was reorganized around his wants and needs and remained so organized for the next twenty-five years. George's father moved to the edge of the family circle. His wife took good care of the house but treated the head of the family as she would a good piece of furniture—mended his clothes, prepared good meals, but rarely participated with him in any social activities.

When George was ready for college his mother decided where he should go. The university was some distance from the home town and there was insufficient money to pay for tuition plus the other expenses of living away from home. Besides, if George went away his mother (and George) would suffer an emotional wrench. Consequently, the entire family, George, his parents and grandparents, moved some two hundred miles to a strange city. George's father was forced to find a new job while his mother opened a rooming house to meet the expenses of college. (The thought had never occurred to the mother that George was capable of earning a little money on his own.)

When George was a senior in college his mother was still closely supervising his studies. She was more elated and sometimes more dejected than George over his grades. She chose the movies they attended together; she bought all his clothes; told him when he should go to bed; when to take a bath; what tie to wear. George at twenty-two had never had a "date." There was no one he could claim as a friend. He was interested in no extracurricular work aside from the honorary club associated with the R.O.T.C., where he never had to make decisions for himself, being merely required to accept and execute to the letter every order given him.

At graduation the mother's protection did not cease. George, although a good academic student, had difficulty in getting a job because of his hollow, opinionated bragging and ego-centered personality. When he was finally placed as a chemist with a steel company back in his original home town, the entire family followed him again. Three months later his supervisor could stand no longer his constant demands for attention, his lack of initiative, his inability to follow instructions unless they were explicit in every detail. He was fired. In the meanwhile George's father had given up his university city job, had not located another, and the family was without support. The only solution lay in returning again to the university community where George's mother could once more take in boarders.

Cases such as George's are the pitiable records of well-intended parents unable or unwilling to permit their children the freedom of choice which is their due. Parents must recognize in the initial rebellions against authority a natural bid for greater freedom. Precisely how much freedom of choice a child should have is not easily determined. The degree of freedom that a child can prudently handle is determined by his age and the success with which he has controlled himself in the freedom previously allowed. Certainly there is no given age at which the apron strings ought



to be suddenly snapped. Instead, the process of developing independence and self-reliance calls for a gradual cutting of the apron strings.

### *Rejection*

Opposed to the error of overprotection is parental rejection at the other extreme. The unwanted child is considerably less frequent than the child loved and humored by his parents. Nonetheless, it would be senseless to suppose that all parents are endowed with sentimental attachments to their offspring. In our present urban culture, as contrasted with the predominantly rural life of a few generations ago, children are very likely to be economic liabilities rather than assets. As such, they are sometimes conceived in passion and born to disgust that continues throughout their childhood and later.

Moreover, in addition to those parents, usually of low educational and economic status, who reject their children, there are others who withhold legitimate guidance and training because of ill-founded fears that all parental attachments are harmful. The theory on which these parents operate is something of this sort: The twisted, queer personalities to be observed are often the result of "fixations"; too great a love for the simple protection of earlier days. Therefore, it is assumed that if children are allowed complete freedom of action the fixations on parental protection will not develop and the children will exhibit healthy, un mutilated personalities.

The basic difficulty with the children of both types of rejecting parents is the development of feelings of insecurity. Where there is an absence of affection, sympathetic understanding, and guidance, the youngsters are like corks on the sea, impelled this way and that by their own unbridled impulses. Their feelings of insecurity often lead them to exhibit unpleasantly aggressive behavior, such as bullying, tormenting, and dominating other youngsters often smaller than themselves.

Statistical evidence supporting this conception of rejected children comes from a number of studies, one of the most recent being reported by Symonds.<sup>6</sup> He examined the histories of thirty-one rejected children, averaging about twelve years of age, and com-

pared them with a similar group of children accepted by their parents. The rejected children were those who received very little or no interest from their parents; whose health and well-being were neglected; who were threatened with being sent to an institution; or who were the victims of severe physical punishment and cruelty. On the other hand, the parents of the accepted children participated with them in games, sports, hobbies, and vacations; they were interested in their youngsters' plans and ambitions; they spoke well of their children and made adequate provisions for food and clothing.

As one would expect, the behavior of the two groups was markedly different. The accepted children were characterized as being cooperative, friendly, loyal, stable emotionally, and cheerful. In contrast, the rejected group revealed a long list of unfavorable behavior patterns. They lacked emotional stability; were given to attention-getting devices; were deficient in ability to concentrate; were frequent truants and runaways; smoked at an early age; used money extravagantly; were often deficient in special subjects. In the opinion of Symonds, as well as of others who have dealt with similar problems, the antisocial behavior of the children was traceable to the neglect and rejection suffered at the hands of the parents.

If the children are not controlled and their impulses directed along acceptable lines of action by their parents or teachers, the world will do the directing later—at greater pains to themselves by reason of the severity of the delayed discipline. A society of any kind demands that certain impulses be thwarted. A doctrine that espouses complete freedom for the child is workable only in anarchy. In an orderly society one cannot walk over and take the neighbor's automobile, pleading the necessity for expressing one's ego. Those parents and teachers who fear lest they bend their children's personalities by imposing some restraint might just as well recognize that the law will do the bending if they do not.

Wise parents will strike a balance between overprotection and complete freedom leading to rejection. The middle-of-the-road course is somewhat difficult to discern, let alone follow. Yet it must be recognized that between these extremes lies the road to a well-adjusted adult personality.

*Consistency and Economy of Orders*

In attempting to follow the middle-of-the-road course just suggested, a prevalent error is to be vacillating in granting rewards or liberties and in imposing restraints. Some adults, for instance, may at first think it "cute" for a toddler to beg for a piece of cake from the table while the rest of the family is eating. The youngster's sly attempts to reach choice morsels may be the cause for half-repressed laughter by those observing from a distance. Later the same behavior, if continued, may be a source of irritation and the child may be reprimanded. Surely the discipline is inconsistent from the standpoint of the child, who is likely to burst into a tantrum of rage. Alternately restraining a youngster from a given form of behavior and later condoning the same action is likely to engender feelings of insecurity. Such a policy is similar to following a crooked, rather than a straight middle-of-the-road course.

Inconsistent and irregular discipline is not only a frequent source of annoying habits and distorted personality in children, but it is an important factor bearing on subsequent marital unhappiness.<sup>7</sup>

Closely allied to the error of inconsistency is the tendency of parents and teachers to multiply their commands unnecessarily without considering in advance the ability of the child to abide by the requests. One four-year-old was heard to interrupt her mother's rapid flow of heated commands with "But, Mommy, I can't do all that at once." One of the virtues that many parents and teachers might cultivate is that of economy in giving orders. Moreover, thoughtful consideration as to whether a given prohibition is of sufficient importance to be insisted upon will prevent children from ignoring requests. A multiplicity of orders to do this or not do that, which are not carried out or enforced, only leads to the habit of disobedience.

It is important to remember also that consistency and justice of commands must not be evaluated in terms of adult standards, but rather in terms of the child's limited comprehension. A parent may tolerate or even encourage Jimmy's drumming as long as it remains relatively subdued. However, the moment it reaches a loud intensity he is likely to impose adult standards and force Jimmy to stop. In terms of the child's limited understanding he may only

be doing better what once drew commendation. His powers of discrimination are limited and he is consequently more susceptible to conflicts. He cannot see the difference between two similar situations, one of which brings him rewards and the other punishment (see pages 58 and 78). It is difficult for adults to view the world from the standpoint of a child, but that is one of the attitudes that ought to be cultivated by those guiding children.

### *Experimental Attitude*

Experts and counsellors in child guidance have noted the marked rigidity of many parents in their attitudes toward guidance principles. One father claimed belligerently that when he was a youngster he "had to toe the mark" and his son was not going "to get away with anything." We have previously mentioned the force of habit which tends to keep parents and teachers tied to given methods of discipline in the face of their manifest ineffectiveness. To a considerable degree, an experimental attitude toward methods of discipline will prove an effective antidote for the crippling rigidities of ill-adapted habits. Without being vacillating and inconsistent, parents ought to be willing to abandon a method of control as soon as it clearly demonstrates its failure and try other methods suggested by their careful analysis of the problem. Parenthood then takes on the aspects of an adventurous intellectual pursuit rather than a frustrating emotional problem. Too many parents fear they are admitting defeat and error if they change their methods of control. It is far better to recognize one's errors and correct them than it is to persist in them stubbornly "to save face."

## 4. GUIDANCE AND LEARNING

Implicit in most of the preceding discussion is the assumption that guidance relies heavily upon the principles of learning. Parental habits of speech, attitudes toward many of the basic issues of living, and special interests, are passed on from one generation to the next by reason of the learning process rather than by the mechanism of heredity. Factors of inheritance may largely account for one's learning potentialities; they may determine to a large extent one's intelligence and physical capacities.

But there is little evidence that personality features are directly attributable to heredity. During the first few weeks of life, newborn infants do reveal differences in personality that are slight, the differences being limited to the amount of smiling, laughing, or crying displayed.

One study compared maternity-ward ratings with those made at twenty-four and thirty months. Some general traits that were loosely defined showed a somewhat surprising consistency from shortly after birth to two years.<sup>8</sup> However, as one lengthens the period over which observations are made the permanence of personality traits declines. The shifting stimuli of the child's surroundings soon eradicate the unique personality features found at or shortly after birth.

### *Habits Grow On Consistent Satisfactions*

Parents who are particularly annoyed by Billy's persistent tendency to throw toys of all kinds in all directions, or Martha's habit of biting her playmates, or Henry's trick of pouring his milk on the floor as soon as no one is looking, are sometimes so annoyed by the persistence of the behavior that they resign themselves to the hope that the children will outgrow the pestiferous habits. The hope may eventually be justified and fulfilled but in the meantime there is a shorter and surer method of handling such problems which derives from the fundamental principle that good, as well as bad, habits live on the satisfactions they bring. To permit the continued exercise of an annoying, troublesome habit in the hope that it will be outgrown is to take the chance that the haphazard play of circumstances may eventually remove whatever satisfactions the child now secures from the habit. It is a chance that many parents do not care to take.

One of the reasons contributing to the persistence of annoying habits is the inconsistency with which the habit is punished. Thumb-sucking is a common behavior system that proves distressing to many parents, although there is little conclusive evidence that it has any direct deleterious effects. One mother who had tried for weeks by "every conceivable means" to break her fourteen-month old son from this annoying habit, accidentally found a "cure." While visiting some relatives the fourteen-month-

old son was placed in a play pen with a child a few months older. Each time "Sonny" put his thumb in his mouth his older playmate calmly pulled it out, without exception. Before the afternoon was over, the habit was broken and had not reappeared two months later. The consistency with which the behavior was inhibited appeared to be the deciding feature.

It may be difficult to determine what satisfaction is secured by the child in executing a given form of behavior. Children in tantrums sometimes bang their heads deliberately on the floor or against the wall. They will continue to suffer this self-inflicted pain as long as the behavior brings them the attention they want or leads to the gratification of whatever whim was the source of the original outburst. If the child is consistently refused any gratification on the heels of such displays of temper, they will rapidly disappear. The principal difficulty is that many parents weaken in their resolves before the tantrum has run its course. In consequence, the child learns that one way to gain a piece of candy or a prohibited privilege is to exhibit a burst of temper, and the more violent the burst the more quickly will the reward be granted. The teacher or parent faced with an annoying child may relieve the problem by first discovering what satisfaction is thus obtained and then withholding that reward.

### *Principle of Substitution*

Not only should one prevent the attainment of satisfactions in the exercise of undesirable habits, but emphasis should be placed upon gaining rewards from actions that are desirable. The tendency is to ignore or at least fail to encourage a child who has spent hours at self-initiated, unannoying play. At the same time it is not wise for parents or teachers to make desirable behavior contingent upon artificial bribes that are held out in advance. A child will soon learn that he can use his potentialities for unpleasant actions as a blackmail club to force others to grant his wishes. The best rewards for good behavior come as natural rewards: the commendation and approval of adults or the satisfactions inherent in the freedom from parental interruptions. Too often barriers against undesirable behavior are set up but no opportunities provided for the exercise and encouragement of good habits.

Taken together, these two principles—withholding satisfactions from annoying behavior and encouraging good habits—leads to the practice of substitution. If Billy likes to throw toy automobiles and wooden blocks, provide him with soft balls and encourage him to throw them into a pasteboard box, at the same time removing all his hard toys. The search for satisfactory substitute forms of action may tax one's ingenuity and imagination, but the search is often well rewarded. The skillful use of substitution will in no sense inhibit the child's developing personality but will merely direct its expression along acceptable lines.

### *Difficulties in Applying Learning Principles*

There are two practical difficulties that parents and teachers face in applying the principles just discussed. First, parents and teachers are usually too close to the children to see the problems in a detached, objective fashion. Their own feelings and judgments are so intertwined with the difficulties that they are unable to see the solution that seems obvious to others not immediately concerned. Child-guidance counselors have often noticed in discussion or forum groups that parental problems referred back to the group for solution are frequently solved by other parents. At the same time, those parents with the ready solution to the problems of others also present problems that are no more difficult than the ones they have themselves solved. Objectivity of attitude and attempts to view behavior difficulties from a distance will often simplify them, making their solution more evident.

Second, parents are more likely than others to excuse behavior deviations in their own children. For this reason behavior patterns of an undesirable sort often get a foothold because of their frequent uncensored repetition before any restrictive measures are taken. The playful shoving of Betty is at first excused by her parents, even though it may mean that smaller Jane is violently knocked to the ground. Later, when Betty's increasing roughness meets with stronger opposition in bigger Harry and she gets some of her own treatment, her parents may again take her part. Such favoritism may be less prevalent in homes of more than one child, but it is certainly a prevalent condition that permits some annoying habits to become well established before parents are entirely

aware of their real nature. Again, it must be evident that harmful behavior will continue as long as it is permitted to pay the child dividends. Behavior that is constructive, that will serve the child's future interests, deserve encouragement. Objectivity of viewpoint will aid parents in achieving these ends.

## 5. SOME SPECIFIC BEHAVIOR PROBLEMS

### *Feeding Problems*

Few parents have avoided difficulties in feeding children. The extent of these problems is revealed by a number of observations. One pediatrician (a specialist in psychomedical problems of childhood) remarked that he had paid for his new house with the fees derived from such cases. "And it was no small house!" An unpublished study reported by Roberts<sup>9</sup> as being done under her supervision indicated that forty out of one hundred children from a well-to-do urban group showed varying degrees of nonhunger at mealtime, so that they had to be coaxed and urged during the entire meal, which often dragged out to excessive lengths. Comparable surveys indicate that feeding problems are among the most frequent difficulties facing parents with young children. Recent emphasis on vitamins, balanced diet, and the like, has probably accentuated the concern most parents have with the amount and kind of food their children should consume. In the early days of life, the most objective measure of a child's progress is his increase in weight. Attention is consequently focused on the number of ounces of milk he takes. If performance is not up to expectation, parents are likely to worry. At a somewhat later age, when the child can understand, he is often urged by all sorts of bribes to "take just one more spoonful." Mealtime is likely to take on the features of a struggle between the child who eats as little vegetable as possible to get the dessert, and the parent who tries to force more and more spinach into an unwilling mouth before giving up. The insistence of parents on eating well-balanced meals three times a day has unnecessarily complicated the emotional accompaniments of mealtime.

The experiments of Dr. Clara Davis<sup>10</sup> on feeding newly weaned children have thrown into clear focus some of the reasons for



particular food refusals. Dr. Davis presented to these children at the age of approximately six months a wide variety of foods such as apples, bananas, peaches, beets, carrots, cauliflower, lettuce, wheat, barley, bone marrow, beef, lamb, liver, brains, and haddock. The selection of foods was not made according to any preconceived notions of what might or might not be good for them, although, of course, no poisonous substances were included. The foods were placed in small dishes on a tray and presented to the children by a nurse. There was no urging of any kind. The nurse merely gave the child the food which the youngster indicated he wanted. When the children were old enough to feed themselves regardless of their table manners, they were left wholly to their own devices. Whenever a dish was emptied it was refilled immediately from a near-by steam table. There was no limit on quantity. Before and at the end of each meal the food was carefully weighed to record the amount of each kind of food consumed.

Under these conditions of unhampered choice even newly weaned children picked a well-balanced diet if one considers the total food consumed over a period of six months. It is true that at times some of the children ate phenomenal amounts of some foods. One thirteen-month old child ate five eggs for supper and later, when he was two and one-half years, he downed ten eggs at one sitting. Another child with rickets chose to consume exceptionally large quantities of cod-liver oil, ceasing only when the condition had corrected itself as verified by medical examinations. These food fads were usually short-lived and compensated for by later periods of apparent aversion for the food that was previously consumed in large quantities. Apparently there is a "wisdom of the body" that goes far to determine the otherwise inexplicable food preferences of children.

The children who have come through these experiments have been singularly free of digestive disturbances. In none of the fifty or more children who have been on this feeding regime for nearly three years has it been necessary to employ laxatives. More important from the psychological standpoint is the finding that as older children they fail to show eccentric food preferences or poor appetite.

The staff at the Cornell University nursery school has called

attention to the learning aspects of eating. According to their approach, parents should make some effort to teach children to like strange foods, even though the foods are first refused. If only a single teaspoon of the disliked food is served and the child is subjected to some pressure and urged to eat it, he may gradually come to accept it. Sometimes only two or three tastes of a disliked food are enough to change the attitude of some children toward it, although more frequently the disliked food must be served at a dozen or more meals with generous time intervals between.<sup>11</sup>

The regime of feeding that Davis has employed is probably too wasteful and uneconomical of kitchen effort to warrant its wholesale application in the home. However, it does reveal that much of the Johnny-won't-get-what-he-needs concern is ill-founded, provided certain dishes are not linked to highly charged emotional attitudes, and provided further that menus include a good variety of nourishing foods. It must be noted, also, that Davis used simple foods without seasonings that might affect their choice. (Salt and sugar were offered "straight.") For these reasons, and also in the light of the Cornell experience, it seems unwise to suggest that all urging be eliminated in feeding toddlers. However, if used habitually the practice may lead to further behavior problems.

One must always remember that unwillingness to eat may merely be a symptom of a more generalized difficulty. After a study of twenty-five cases of eating difficulties in children, one investigator reported that the family background was generally unsuited to satisfactory adjustment, the mother being immature, but dominating, the father ineffective and undependable.<sup>12</sup>

Hunger is a powerful biological drive. Unless there is some contributing physical disorder, the natural tensions comprising this drive will ordinarily force the individual to surmount obstacles placed in the way of eating. Unfortunately, parents are unduly disturbed by minor variations in children's appetites and fall quickly into the coaxing habit. Even "good" eaters occasionally dawdle over their meals, especially when they begin to eat with grown-ups and social interests compete with the hunger drive.<sup>13</sup> Bribes and panicky urging unnecessarily complicate an action that will, if given a reasonable amount of freedom take place quite naturally and completely.

*Jealousy*

One of the insidious, difficult problems facing teachers and especially parents is jealousy among children. It is insidious because its beginnings are often unrecognized and its causes are sometimes hidden in the subtle relationships of husband and wife toward each other and their children.

The extent and importance of jealousy as a problem is revealed by the White House Conference report that approximately one-third of all children less than twelve years of age manifest its symptoms,<sup>14</sup> although other studies have placed the frequency somewhat lower.<sup>15</sup> Fortunately, jealousy normally decreases as the child grows older. It is interesting to observe further that the more intelligent children are more likely to be jealous than those who are dullards. Accordingly, it is especially important that parents coming from the college population should be on guard against conditions that tend to excite the crippling behavior of jealousy.

What is the psychological nature of jealousy? What are some of the factors that tend to produce it? How can it be avoided?

Jealousy appears to be a reaction stimulated by feelings of either inferiority or insecurity aroused because the individual's close relationship with the parent or some other person is threatened. Child behavior that is rooted in jealousy is usually designed to regain the status formerly enjoyed in the eyes of the loved one. Like other forms of action induced by thwarting conditions, jealousy is often ill adapted to achieve the desired ends. The jealous child may resort to boisterous actions, to slapping or pushing other children, to attempts at monopolizing the conversation, or to other forms of attention-getting actions regardless of their other consequences. Unfortunately, some parents fail to see any connection between their own distribution of attentive affection and the unruly behavior of the child.

The most prevalent condition productive of jealousy is that in which the child feels displaced in his parents' affections. Parents may, intentionally or otherwise, divert too much time and attention to a younger brother or sister, or else they may display too much affection for each other, ignoring the needs of the child for a similar kind of security. Some experts in child guidance have maintained that jealousy between siblings is virtually inevitable.

The facts revealed by the investigations already mentioned do not support this contention. Nevertheless, families where one child is obviously favored are fertile grounds for the development of behavior patterns in the nonfavored child that will handicap his personality development. Occasionally, misguided parents take delight in exciting the jealousy of one child for the pleasure they derive in observing the expression of deep-seated attachments. If such parents realized the difficulties of eradicating excessive jealousy once it is aroused, they would understand that their own pleasures are bought at a high price.

Much has been made of the need to prepare children for the advent of a new infant in the family. It is assumed that if Harry knows in advance that he is to have a brother or sister there will be fewer difficulties in making an adjustment to the new family arrangements. However, some kinds of preparation are of doubtful value. One mother explained to her daughter that she was about to have a new brother or sister. She explained that the second child was to get half the mother's love, that the daughter was to divide everything with the newcomer. In view of the fact that the mother emphasized the sacrificial aspects of the change, there should be no surprise that jealousy developed in spite of (perhaps because of) the preparatory explanation. It is entirely possible for the preparations made for the new member of the family to be on a plane of mutual helpfulness, actually giving the older child some simple responsibility in connection with the infant. It is probably true that many of the attempts to forestall jealousy in older children by informing them in advance of the new arrival are failures. In a study of seventy cases one investigator found such preparation made no difference in the manifestations of jealousy.<sup>16</sup> It is not sufficient to warn children that a new child is coming; their active cooperation and interest in the new baby must be aroused.

Harking back to an earlier point made in this chapter, we know that some instances of jealousy are traceable to parental maladjustments. Mothers or fathers sometimes overcultivate the child's love as a compensation for their own disappointments in marriage. A dispassionate examination by parents of the distribution of their own affection and attention will assist in appraising the jealous behavior of their children. As Dr. Leslie B. Hohman has so aptly

expressed it, "Mothers and fathers who make sensibly directed, sensibly controlled affection the dependable, invariable regime in their homes—with the penalty of undramatic failure and more positive punishment if necessary, for all unwarranted resentment—will not rear children who are faced with a lifelong struggle against consuming jealousy."<sup>17</sup>

### *Sex Education*

The sexual education of children is a topic that has been bandied about from school to home and back again, with most authorities agreed that children should receive such education at home but also agreed that parents generally either will not or cannot do the job properly. Parents are often too ill-advised or too embarrassed by their own sex adjustments to impart satisfactory sex information to their children. The school has been reluctant to accept the task, partly because of the fear that a frank discussion at the child's level will precipitate an increasing interest. A junior-high-school principal who headed a special subcommittee on the subject reported:

It is a question of moment whether it is not wrong for the school to shoulder the responsibility of shortening for these little ones their period of innocent childhood and of awakening in them an interest in a topic for which they are not ready.

The same report indicated that a home for unmarried mothers had received from this same principal's school an average of two girls a month.<sup>18</sup> It is evident that the innocence of many junior-high-school students is shattered by ignorance. It might better be shattered and protected by knowledge.

One of the benefits that has come from psychoanalysis sponsored by Freud, Jung, Adler, and others, is the emphasis placed on the pervasiveness of sex. Many psychologists feel that the analysts have overexaggerated the role of sex in life but that overexaggeration has caused many to recognize its place where they otherwise would have denied it. The "hush-hush" attitude of a past generation largely proceeded on the assumption that sexual interest does not appear until puberty. Most experts will agree now that rudimentary forms of sex interest are normally present in early childhood. Certainly, by the time children enter school they

are aware of differences between boys and girls even though the physiological differences may remain unknown. Differences in clothing, differences in parental treatment of boys and girls, the insistence, for example, that "little boys don't play with dolls," or that "little girls shouldn't be so rough," are only samples of the influences tending to sharpen the distinctions between the sexes. Moreover, not infrequently children under five years accidentally discover enjoyment in touching particularly sensitive parts of the body, such as the genitals. It is a gross mistake to assume that children are sexually ignorant before puberty.

Because of the general restraints placed on the frank, dispassionate discussion of sex behavior and the relative paucity of reliable information available to children, it is highly important that parents especially keep the problem simplified by giving only correct factual information when occasions arise. Parents ought to assume as complacent an attitude toward children's questions concerning sex as they do toward all other questions of childhood. Instead, many parents are suddenly thrown into a state of flustered confusion when a five-year-old asks innocently where his two-weeks-old sister came from. The parent is as likely to evade an answer as to give any one of the fairy tales of his own youth. If the child is at all intelligent or inquisitive he may shortly discover from other sources that his parent's story is somewhat mystifying, with the result that his curiosity is further aroused. On the other hand, the parent who answers sex questions in a simple, uncomplicated, direct fashion, giving only the information that is asked for as naturally as he would any question about automobiles or airplanes, is taking the first step toward insuring the child's healthy adjustment. Misinformation and evasive answers lead only to further surreptitious searching.

Probably the most pervasive reason for withholding sex information from children by parents who are properly informed, is the fear that undue curiosity will be aroused, leading to more serious problems. The wisdom of honesty in sex education is revealed in a great many instances, of which the following are rather typical.

A three-year-old on her birthday asked her mother where she came

from three years before. The mother fell easily into the current deception:

"Oh, the doctor brought you."

"Dr. Blank?" the girl demanded, naming a doctor of whom she was fond.

"No, it was another doctor whom you don't know."

"Will I ever see him?"

"Yes, maybe, someday. Mother has to go now."

"Where did he get me?" pleaded the girl, running beside her mother who welcomed the relief of rushing away to keep an appointment.

The next day the girl's six-year-old sister told the mother that the younger girl had questioned her so persistently that she had told her younger sister all she knew—that children began to live in their mother's body, starting from a seed from the father's body, and had come out when they were babies on their birthdays.

The mother, realizing that the previous day's fabrication looked rather silly, went to the three-year-old and said in a matter-of-fact way:

"Now you know where you came from, don't you?"

"Sister said from you," answered the girl.

"That's right, and do you remember more than that?"

It was apparent that the youngster had forgotten but was no more embarrassed than if she had forgotten someone's name. The story of the seed and its process of growth had aroused less curiosity than the fable of a mysteriously important doctor who by some unexplained fashion obtained and distributed babies.<sup>19</sup>

In another instance a father took his sons, one less than three years old and the other eight, to a cattle barn where they were fascinated by the long row of cows with their heads in stanchions. The father pointed out one cow in a box stall and called attention to her large size, remarking that a small calf was inside her and would come out when the calf was strong enough. The boys showed a mild interest but soon turned to the milk cows. A day or two later the father discovered the boys playing with stuffed animals with the heads pushed through the rungs of a chair, playing at milking.

"You remember the cows," the father said to the younger boy, "Where was the calf?"

"Where *was* the calf?" the boy appealed to his older brother. "I didn't see him."

"Oh, you know," the older boy said with some patronage; "the calf was inside the big cow."

There was no shyness nor the slightest hint of hidden sex curiosity.<sup>20</sup>

Some parents make the twin mistakes of giving sex information on especially arranged occasions and in large doses. As the first of the above examples illustrates, even some of the simplest concepts of growth are beyond the understanding of children when they first raise questions concerning sex. Their simple questions call for simple answers rather than long technically phrased explanations. The occasions for imparting information need not be elaborately planned in advance. Instead, each question should provide an opportunity for enlarging and molding the child's concept of the proper place of sex in life.

No one has yet demonstrated that the gradual development of sex concepts and sex morality through the constant guidance of children during the early years with truthful information has contributed one whit to greater immorality. On the other hand, a training that does not make of sex something shameful and unnatural but yet recognizes unapologetically the intense physical pleasures attained only under enduring conditions of mutual respect, admiration, and affection—such a training will go far toward controlling promiscuous relations and building a well-adjusted personality. In order that parents and teachers may achieve these goals in the guidance of children, it is obviously necessary that their own sex relations be well adjusted. Adult self-education is perhaps more important in this field of guidance than in any other.

### *Truthfulness*

Probably there is no child who does not at some time intentionally deceive others. Few intelligent parents have been unconcerned and positively sure of the best way of disciplining their children when they first exhibit this universal failing. The problem is difficult to handle in the abstract because the reasons for lying are varied. It will be well to examine briefly the principal kinds of childhood lies in order to gain a clear perspective of the psychological problem divorced from its moral and ethical implications.

Children may playfully confuse fact and fancy. Such falsehoods are illustrated by bizarre tales, such as meeting a man down the street who gave the child the pennies that she lost before she got home. Such stories ordinarily call for no concern other than to



sympathize with the child in her "loss," calling attention to its imaginary character.

Some lies are distortions of fact produced by confusion. Children are less able observers and are led easily to confused notions by unintentional suggestions either by adults or by attendant circumstances. (See *Testimony and the Courtroom*, page 426). Failing to recognize the basic nature of such lies, some parents persist in their cross-examination, causing the child to fabricate further in order to straighten out his original story. The reprimands that follow in such cases are neither justified nor necessary, since the falsehoods were forced on the child by an overzealous parent.

Still another type of falsehood which is not always reprehensible is that one which protects the feelings of others. These are the so-called white lies that reduce the friction of social contacts. It is exceedingly difficult to draw a line between those deceits that are motivated by selfish reasons and those that spring from pure consideration for others. One need not encourage such prevarications since society in general seems to reward sufficiently the individual who lies to prevent embarrassment to others.

Aside from these three kinds of lies, falsehoods are usually symptomatic of some maladjustment. Children (and some adults) lie to magnify their own importance or accomplishments, to gain revenge, to shift responsibility for some misdeed, and to short-cut the achievement of some end attainable by more arduous measures. These are the lies that should cause some concern for parents and must be treated as any other sign of maladjustment. Specifically, one should search for the causes of the fabrication and then either provide acceptable ways of attaining legitimate ends or prevent the youngster from receiving any benefits from the attempted deception.

Two factors are prominent in the production of unwholesome fabrication. The first of these is parental precept and passive approval. Parents who habitually lie to others in the presence of their children are obviously setting an example that may be followed to an extreme. White or gray lies of adults are not distinguishable by young children from black lies and may readily establish a disrespect for veracity. At the same time, some adults may look upon early fabrications as especially cute. One parent

was seen to laugh heartily when his young son told him solemnly that the puppy had probably carried off his father's missing golf balls. The obvious fabrication was passively rewarded and, like all actions that bring satisfaction, was thereby rooted a little deeper in the child's fund of behavior patterns. Again, objective self-evaluation of parental behavior may reveal the source of the child's difficulty.

The second factor associated with lying is fear of punishment. Sargent discovered that honesty in children was related to the child's willingness to confide in his mother, the parent's belief in the child's truthfulness, and reliability in keeping promises to the child. Although there was no significant difference in the *kind* of punishment administered by parents of truthful and untruthful children, there was a difference in the *severity* of punishment, the untruthful children being punished more severely.<sup>21</sup> Apparently the fear of severe and possibly unjust punishment is more productive of lying than milder and better considered restrictive measures.

Finally, parents and teachers will do well to remember that lying is not a general trait manifesting itself in all or even a majority of the situations where deception is possible. The studies of Hartshorne and May<sup>22</sup> have demonstrated the specific character of deceit. Some children may be scrupulously honest in all school tests but may falsify when money is concerned. In other children, the reverse may be true. The child ordinarily fabricates when he is faced with a difficult adjustment, when, for instance, the opportunity to get an extra piece of candy conflicts with the necessity of returning all the change from the grocer. If the child succeeds in his deceit, thereby gaining some satisfaction, he will tend to repeat the identical form of dishonesty in the future.\* Consequently, attempts to correct lying should also be specific. They should be directed toward the removal of satisfactions from the deceit. Appeals to general principles of morality and ethics are likely to be wasted on children in the early grades.

\*It is interesting to observe in this connection that thieves, confidence men, and burglars tend to stick to a given *modus operandi*. One man may always perform daylight burglaries in apartment houses, opening the locks in a given manner and taking only a special class of goods. Police often gain confessions to a string of robberies from a given criminal simply because they have all been performed in the same way. The thieves rarely change their "racket." Their deceptions are specific.

*Work and Money*

One of the surest ways of developing an irresponsible, lazy spendthrift is to deny in early childhood the exercise of normal desires to "help." Parents of school children who are failing because they are indifferent to work and bent only on pleasure might look back to those early days before school to see whether or not the halting, clumsy efforts to help Mother in her sweeping or Dad in his gardening were really encouraged.

Three-year-old Harriet's mother pushed her aside, complaining that she made more trouble in dusting than it was worth. Besides there were a lot of nice toys out in the yard for her to play with. No wonder that Harriet refused at thirteen to help with the dishes or tidy her room. If habits of industry and satisfaction from legitimate efforts are to be readily cultivated, they cannot be stunted at the time of their first appearance.

Opportunities to earn money or a regular weekly allowance contingent upon the performance of routine chores are convenient ways of building an appreciation for money and its value. There is no better substitute for the training in self-control than that which is provided by the necessity of planning one's purchases in the light of one's income. Many overprivileged and bored children are such because their every want has been granted by indulgent parents who in some cases anticipated their desires and satisfied them before they were aroused. In so doing the adults, anxious to give their children every opportunity, actually robbed the youngsters of the joys that come only after a long period of anticipation. Children who are early placed in the position where they must decide for themselves whether they are going to go to the movies today or save their money to buy a more enduring trinket next week, are laying the foundation for independent decision-making in later life.

Parents who provide children with allowances must recognize at the outset that there will be mistakes. Potent and passing whims may make sudden inroads into the child's account, inducing him to make appeals for more money. If, in such cases, an open-handed policy is pursued, much of the training value in allowances will be lost. In order to solve this aspect of the problem, some have permitted a system of "loans," with a debt limit which cannot be

be exceeded until the loan has been repaid. In other cases, special jobs around the house have been open to the child industrious enough to earn a "bonus." In making mistakes during these early years of "financing," and in suffering the consequences of those errors, the child may learn lessons of care and foresight that will prove of immense help in later years.

The extent to which children can be depended upon to manage their own affairs varies widely. One thirteen-year-old daughter was given a bank account with regular additions to it each month from which she was expected to pay for her schooling, clothes, doctor and dentist bills, parties, summer camp, and music lessons. She had been gradually prepared for those responsibilities during her earlier years, but the delight she had in deciding whether she could afford new shoes and the dismay at foregoing a matinee because of an unexpected dentist bill, were beyond her powers of expression. Unless well prepared in advance, most children of the same age would be hopelessly confused by the magnitude of this girl's task.

### *Fears*

The crippling effects of unnecessary fears in adults were discussed in the preceding chapter (see page 78). No less crippling are the unreasonable fears of childhood. Fortunately, the latter are somewhat less complex and can often be readily eliminated.

From general psychology the student will recall that most authorities agree that fear responses are one of the earliest emotions observable.\* Ordinarily the stimuli for fear during early infancy are of an elementary sort, being any sudden, intense stimulus or loss of support. Aside from fears excited by these stimuli, all others develop either through some learning process or as the result of the child's increasing comprehension of his surroundings.

The process of learning to fear a harmless object is illustrated in the case of a nine-months-old infant who at first readily accepted a flexible rubber toy. A few days later she accidentally lost her wobbly balance and fell on the toy, which gave off a sudden shrill

\*The observations of Bridgman, Irwin, and Sherman do not wholly substantiate Watson's conclusion that fear is one of the three primary emotions present at birth. They do agree that whenever one emotion can be distinguished from another, fear is among the first to be so distinguished.

whistle. The combined loss of position and the sudden intense noise provoked a fear reaction that was quite naturally attached to the sight of the toy. Thereafter the child not only cried whenever the toy was presented but retreated from it as far as possible. For a time the toy served as effectively as a gate to prevent the child from going through a doorway. The process of conditioning, illustrated in the above example, accounts for the development of many childhood fears and aversions. Some food preferences are similarly traceable to some unpleasant stimuli being presented at about the same time as the new food.

Fears also develop with an increase in the child's understanding of his surroundings. A youngster who formerly showed no withdrawing responses in the presence of dogs may quite suddenly, without apparent reason, cringe and cry when they approach. The new form of response, in the absence of any conditioning experiences, is apparently due to the child's increased comprehension of the potential harm represented by the dog. Similarly, fear of insects, snakes, firearms, dangerously high places, and other potentially harmful objects or conditions mature as the child develops intellectually.

Most parents will agree that it is important to instil at least a healthy respect for dangerous conditions such as heavily traveled highways, deep, swift streams, and so on; but most of the remaining fears handicap rather than aid the child's development. An intense fear of water may not only handicap his social participation in the sports of his friends but may prevent him from learning to swim and being able to handle himself in an emergency. Consequently, how can fears be eliminated? how prevented?

Children often fear those conditions which they cannot control. An unconditioned fear of the dark can often be explained in terms of the child's inability to control himself or his surroundings without bringing harm to his person. A fear of water can similarly be explained. In such cases, the obvious line of attack is to teach the child to control the feared situation. Few people who swim well are terrified by the water. A fear of the dark may in some cases be eliminated by teaching the child how to turn lights on and off. If the fear of darkness persists into the preadolescent years, he might be encouraged to run a "magic lantern" or motion-picture pro-

jector. One pair of sons was terribly shy—their reticence amounting almost to a fear of meeting strange people. Their sensible father first gained their confidence and trust by pointing out the virtues of shyness and never calling attention to their own retiring behavior. He then seized natural opportunities to increase their "social courage." They were asked to buy tickets for the family at the railroad station, to enquire the time from an old gentleman, to come in late for luncheon when guests were present and say, "Sorry I'm late." By the time one had called at his father's club to ask if he was there, the boy had practically conquered his shyness. If fears come from the inability to function well in the feared situation, learning some skill leading to mastery over the situation will often relieve the condition.

On the other hand, if a fear has developed through the conditioning process, it can often be eliminated by counterconditioning. One investigator was able to eliminate a fear of furry animals, real and stuffed, by a very ingenious arrangement. At the moment the child began to eat his lunch a rabbit in a cage was placed within view but far enough away so it would not disturb the child's eating. Each day the procedure was repeated and each day the cage was moved closer to the boy. The pleasures of eating were gradually conditioned to the object which had formerly aroused fear. Eventually the rabbit could be taken out of the cage and placed directly in front of the child without causing the slightest indication of fear. Finally, the boy ate with one hand while he stroked the rabbit with the other.<sup>23</sup> It is important in attempting to eliminate fears by the counterconditioning method that the procedure be very slow, otherwise the pleasurable stimuli (in this case, food) may evoke the unpleasant emotions attached to the feared object.

Parents have often relied implicitly upon the hope that a child will outgrow a fear. Sometimes that hope is fulfilled but often it is not. Even in the cases where a fear gradually disappears with the passage of time, careful study reveals that the child has quite by accident either been counterconditioned or has gained a skill that masters the fearsome situation.

Two other frequently used methods of dealing with fears generally prove less effective than the procedures discussed above. The first is continued exposure to the feared condition. Children afraid

of the water have been thrown off the end of a diving board with the none-too-sure protection of an adult swimmer near by. This Spartan technique sometimes works to eliminate the fear and develop swimming, although it has also operated to instil greater fear and make it more difficult to learn to swim. At best the method is uncertain.

The other equally ineffective procedure is dependence upon ridicule and other forms of verbal appeal. The author is acquainted with a woman who has an abnormal fear of lightning. This woman has been chided by many of her relatives about her fear; she has read accounts describing the dangers from lightning and the places that are quite safe in a storm. She is conversant with much of the physical nature of lightning and its causes, yet her fear persists in spite of all this verbal appeal. The case files of many clinical psychologists are replete with examples of children's fears that have been unsuccessfully treated by ridicule and persuasion.

## 6. SUMMARY

The discussion of mental hygiene for teachers and parents has emphasized four principles. First, the behavior and adjustment problems of children are often reflections of similar difficulties found in their parents, who are frequently blind to their own deficiencies. Second, habits good and bad develop and persist largely because they bring some kind of satisfaction to the individual. Third, some of the problems of adjustment and guidance stem from the incompatibility of the aims of child guidance or a complete absence of any clearly defined objective. Fourth, attitudes of parents leading to overprotection, rejection, inconsistency, and a stubborn rigidity in discipline methods are inimical to the child's mental health.

In addition to these basic concepts we have discussed some of the specific guidance problems that confront a large percentage of parents in the early years of a child's life. Jealousy in children has been described as a reaction against the loss of security found in the affection of some loved one and may be avoided or corrected by a more even distribution of time and attention among the members of the family or classroom. The question of sex education has been discussed, pointing out the necessity for the early recognition of

sex interest and imparting truthful information at an early age. Children's attempts at deceit have been analyzed to show that not all are necessarily indications of depravity. The simplest way of handling those that are motivated by selfish interests is to withhold any possible satisfaction that may derive from the deceit and at the same time provide acceptable ways of attaining legitimate goals. A sense of responsibility and independence is readily developed by means of a prearranged system of allowances and chores that permits the development of a concept of the value of money and the necessity for postponing some pleasures and satisfactions for the sake of larger and later ones. Finally discussed was the growth and treatment of fears that interfere with a well-adjusted personality.



## Chapter 5

### ADJUSTMENTS IN OLD AGE

The unique psychology of old age, long neglected by applied psychologists, is of greater importance to college youth than one might imagine at first thought. Adjustments of senile people are significant to others for two reasons.

First, many of the problems of adjustment in the later years of life are attributable to inadequate preparation during the more active years. Many spend twenty, twenty-five, or even thirty years preparing for the rigorous tasks of maturity and middle age, looking forward to an enjoyable, secure retirement, only to discover that retirement, leisure, and security turn sour in the tasting. Sensible preparation for retirement is just as reasonable as preparation for work.

Second, the adjustments older people make are often the concern of youth and will continue to be so increasingly, at least for the next thirty years. More old people are living today than ever before in the world's history. Unless prevented by some queer quirk of circumstance, medical research will continue to extend the life span so that people over sixty may grow in numbers to such an extent that they will exert a very important political and sociological influence on business, government, education, and home life. The unsuccessful threat represented by the Townsend clubs of 1936 and 1940 will grow in potentialities in the coming decades during which the present generation of college students will be active in community life. Lobbies for the aged may exert important effects upon tax programs, thereby reaching into the pocket-books of younger people. Moreover, the presence of more old people in the modern compact home has already been the source of much unnecessary friction, experienced to a lesser degree in previous generations because homes were larger and older relatives less numerous.

The following pages deal with three central problems. First, what are the general capacities, interests, attitudes, and abilities of old people? Second, what are some of the ways of preparing for one's declining years? Third, what are some of the present and future possibilities in aiding the adjustment of old people?

As the following pages will point out, there is no sharp line of demarcation between late maturity and old age, but for the sake of clarity persons over sixty will be considered seniles, while later maturity will include those from forty-five to sixty.

### 1. SOME POPULATION STATISTICS

The importance of the problem is emphasized by population statistics. The following chart shows not only the trend since 1850 but gives an indication of the changes that are most probable for the coming four decades.

It can be seen that in 1930 about 16 per cent of the population were fifty years or older. In 1980 the same age group will probably constitute 32 per cent of the population. By contrast, about 8 per cent of the population in 1850 were fifty or older.

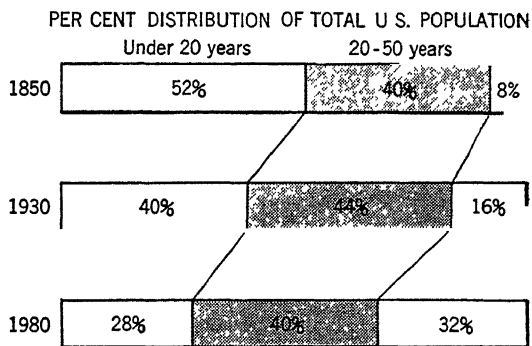


Figure 1. Showing the Changing Structure of the Population. Adapted from L. I. Dublin, "Longevity in Retrospect," *Problems of Aging*, The Williams & Wilkins Company, 1939, 113.

The changing structure of the population is the result not only of the beneficial effects of public-health programs, but is also partly due to the declining birth rate first markedly evidenced after World War I. In the absence of official figures, it has been estimated that the birth rate in 1900 was approximately 30 per 1000. By 1915

it had fallen to 25 and in 1940 it was not much over 16 per 1000. So far as the United States is concerned, immigration, once an important factor in determining the age distribution of the population, will probably play a minor role in the future. Unless something revolutionary occurs, the nation will be one of oldsters.

In view of these facts and predictions it is surprising to observe that psychologists and medical practitioners alike have tended to ignore the problem of age, concentrating attention rather on childhood and youth. The unique psychological problems of aged people have only recently enlisted research interests. Nevertheless, the immediate problems are pressing and growing in importance so that a psychology of senescence will undoubtedly take its place along with the psychologies of childhood and adolescence.

## 2. CAPACITIES OF OLD PEOPLE

Life past sixty has aptly been called the "declining years." The term applies not only to physical characteristics but also to psychological features. Occasionally there are exceptional men or women who are "seventy years young," apparently still going about their daily chores with enthusiasm, zest, and an eagerness more characteristic of younger people. By and large, however, studies of the average man and woman beyond sixty support the common unsystematic observations of everyday life. Psychological functions that most closely approximate the physiological decrements are those motor and sensory functions intimately related to physiological conditions. Decreasing sensory acuity and decreasing speed of movement are examples of this generalization. Contrary to some popular opinion, the highest and most complex psychological functions, such as imagination and interpretation, are generally retained longest, at least in so far as their measurable aspects are concerned. There is some modern scientific foundation for Emerson's conclusion that the essence of age is intellect.

It will be of value to examine in some detail the available evidence showing precisely in what respects and to what degree various psychological functions decrease with advancing years.

### *Intelligence*

Figure 2 presents evidence from two independent studies of adult intelligence using two separately standardized tests. The curve

representing the Jones and Conrad<sup>1</sup> study is based upon 547 persons between twenty-four and sixty years of age, while the study by Miles and Miles<sup>2</sup> included 823 persons. The remarkable similarity

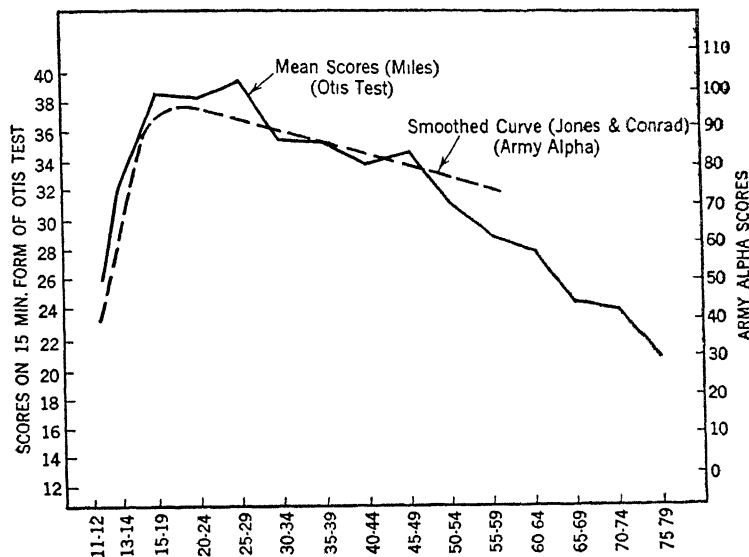


Figure 2. Showing Effect of Age on Intelligence Test Scores. Redrawn from S. L. Pressey, J. E. Janney, and R. G. Kuhlen, *Life: A Psychological Survey*, Harper & Brothers, New York, 1933, 163.

in the findings in the face of wide differences in the populations studied (Jones and Conrad tested New Englanders; Miles used Californians), argues for the validity of the observations.

It is apparent that the highest scores on the tests were attained by those between twenty and thirty years of age. The decline from that point to fifty-five or sixty is steady and very definitely in evidence but not precipitous. Unquestionably, the average individual decreases in his tested intelligence as he advances in years beyond thirty, but the degree of decrease is in no sense a serious or an important one. However, beyond sixty the observed decrement per year is somewhat greater.

In interpreting these findings one must bear two considerations in mind. First, not all aspects of intelligence decline as Fig. 2 might indicate. As mentioned previously, tasks calling for speed place the older person under an unusually heavy handicap. The

tests employed in both studies included some items involving speed. The Jones and Conrad study demonstrated little or no decrease in tests of information or vocabulary ability where speed was not an important feature of the task

Some students and social reformers, in reviewing the relation of age to intelligence among adults, have erroneously concluded that all people sixty years old have less intelligence than persons eighteen, twenty, or twenty-five years of age. Nothing could be more misleading, for the curves in Fig. 2 are merely averages and do not represent the great variability that actually exists within any single age group. Differences in intelligence between the averages at each age are less than the differences found within any group of people of the same age. Some people seventy years old may be superior to others who are only twenty.

In summary then, it is evident that in general the composite abilities represented by an intelligence-test score decline gradually from a maximum between twenty and thirty years of age until approximately fifty-five or sixty. Beyond that age the general intelligence of the average person declines more rapidly. Not all aspects of intelligence decline at the same rate or according to the curves representing general intelligence. Finally, great individual differences are found at all ages that make hazardous any deductions concerning the intelligence of individuals when only their respective ages are known.

### *Learning and Memory*

Two widespread beliefs have characterized most conceptions of old people. The first is well expressed by the proverb, "You can't teach an old dog new tricks." Old people are expected to be slow learners. The second belief is that old people generally have poor memories. The two beliefs are closely related psychologically. But what is the evidence on these issues?

Unfortunately, few studies of adult learning have included persons beyond forty-five or fifty years of age. A very well-known report by Thorndike of a group of studies on Teachers' College students twenty to forty-five gained much attention for the conclusion that "nobody under forty-five should restrain himself from trying to learn anything because of the belief or fear that he is too

old to be able to learn it.''<sup>3</sup> It will be noted that this statement does not imply a complete retention at the maximum level of learning ability throughout the years of maturity. Rather, the data on which the statement is based indicate a slight drop in learning ability from a peak point about twenty-two or -three years of age. The decline up to the forty-fifth year in university students, however, is quite insignificant, as Thorndike correctly suggests.

Is the decline recorded in Thorndike's studies inevitable? Can it be slowed or checked? Thorndike suggested that one of the possible reasons for the slight decline in learning ability beyond twenty-five years of age was the onset of unavoidable degenerative biological processes. He was quite convinced that the degenerative processes were not, however, the sole cause of the drop in learning power. It remained for Sorenson to demonstrate that persons more than sixty years old, when matched with younger persons of equal occupational and educational status, showed no decline in their ability to grasp the meaning of standard test paragraphs. Indeed, these same elders were superior to the younger persons in vocabulary ability.<sup>4</sup> On the other hand, when the subjects of investigation have not recently been in contact with learning situations, they do show a decline in learning ability.<sup>5</sup> From these and similar data Sorenson concluded that disuse rather than biological degeneration is largely responsible for the recorded decline in learning ability. Consequently, one way to avoid some loss in learning ability is by continued contact with stimulating literature, and situations that call for some out-of-the-ordinary learning responses.

Dovetailing with the work of Sorenson and Thorndike is the study reported by Ruch, in which both verbal and motor learning at various ages were investigated. The first of two motor skills called for the development of a simple eye-hand coordination habit; the second demanded the same action except that the subject observed his movements as they were reflected in a mirror. The verbal tasks required the subject to learn (*a*) a series of logical associations (stem—bud; man—boy); (*b*) a series of nonsense equations ( $a \times b = r$ ); and (*c*) a group of false multiplications ( $3 \times 6 = 15$ ). The following figure represents the average performance of each of two adult groups, allowing the performance of an adolescent group to be represented by 100.

The figure shows some decrement in performance on all the tasks and in every case the sixty to eighty-five year group did more poorly than the middle-aged group. One other thing is to be noted.

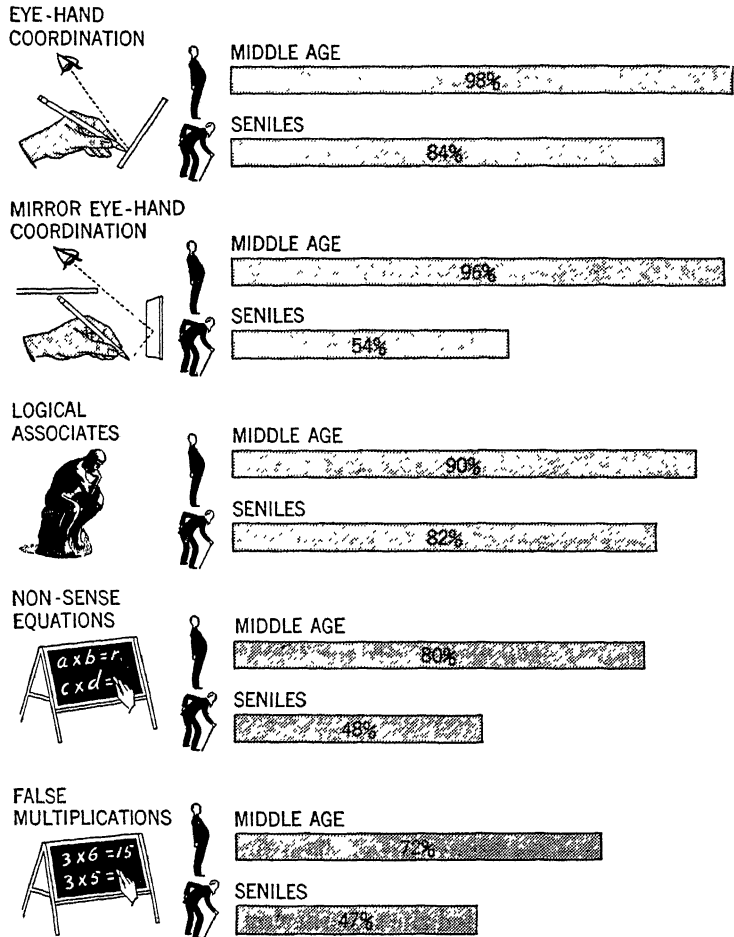


Figure 3. Showing Average Proficiency of Two Groups on Several Tests. Performance Is Expressed as a Percentage of the Scores Obtained by a Group 12 to 17 Years of Age. Adapted from F. L. Ruch, "The Differentiative Effects of Age Upon Human Learning," *Jr. Gener. Psychol.*, 1934, 11, 261-286.

The oldest group was under the greatest handicap in those tasks which conflicted with their established habit systems. Nonsense materials and mirror vision or hand movements forced the subjects

to reorganize some of their perceptual-motor habits. On the other hand, the paired associates and direct-vision learning were not directly opposed by any previous habits of long standing. In other words, old people can learn new tasks with something like a 15 or 20 per cent decrease from maximum efficiency, provided the new tasks do not demand important revisions in habitual forms of acting and thinking. The situation is somewhat analogous to an old house. It is sometimes easier to add new rooms to those already built than to reorganize the floor plan.

Studies of memory among old people have not always agreed as to the degree of impairment at various ages. This condition is partly the result of differences in the kind of memory tested. There are at least two kinds that seem to follow different laws. First is immediate memory, or that ability to recall experiences of the preceding moments or day. Second is remote memory, or the ability to recall experiences of some days, weeks, or years previous. Many observers agree that seniles are particularly deficient in immediate memory while remote memory suffers little impairment.

A recent study has compared the memory of 174 persons sixty to sixty-nine years old, with an equal number twenty to twenty-nine years old. The two groups were equated as to intellectual level. Memory was tested in a variety of ways, as shown in the following table which gives the average percentage loss on each task assuming the performance of the younger group to be standard. In other words, the score obtained on the test of visual memory span for digits was on the average 8.5 per cent lower in the older group than in the younger. (Average score for younger group, 8.21; for older group, 7.51. The difference is 0.7. The percentage loss is therefore  $\frac{0.7}{8.21}$  multiplied by 100 or 8.5) The same interpretation can be applied to all other entries in this table.

Again it is evident that no single generalization can be made concerning memory losses in old people that will cover all types of material. There is least recession on tests calling for simple repetitions devoid of meaning (digit spans). The greatest memory losses are found in those tasks calling for some reorganization of existing patterns of thinking. Of course, the most obvious finding in this study, as well as the others reviewed, is the unevenness of the decline on different tasks. This feature is also illustrated in the



Table 2. Percentage Loss in Memory Tests Applied to Old People (Sixty-Sixty-nine years) as Compared with Performance of Persons Twenty to Twenty-nine Years Old\*

<i>Percent Loss</i>	<i>Test</i>
8.5	Visual Memory Span for Digits
11.8	Auditory Memory Span for Digits
21.2	Reversed Digit Span
21.3	Sentence Repetitions
26.2	Knox cubes (Reproduction of designs with blocks)
39.7	Retention of Paragraph
41.8	Immediate Memory of Paragraph
45.9	Memory for Designs
54.6	Retention of Paired Associates (Illogical)
58.7	Paired Associates
60.4	Retention of Turkish-English Vocabulary

studies made by Miles and discussed on page 241 in the chapter on Efficiency in Production.

The significance of these facts for adjustment must be obvious. The mere fact of age is no excuse for retiring physically and mentally. Old dogs can be taught some new tricks. At the same time, frustration and discouragement are likely to follow efforts to force the older generation into new habits or skills that are directly opposed to those already established. The findings of Sorenson are significant in suggesting that continued exercise of those functions employed in learning forestall the decline in modifiability. For people who retain the pliant, supple characteristics of youth, adjustment to progressive changes in themselves and others is accomplished with relative ease. The mental rigidities of age contribute much unhappiness and discontent. They are not always the necessary consequences of accumulated years.

### *Perceptions*

Perception depends to no small extent upon the efficient operation of certain physiological mechanisms. As pointed out at the beginning of this section, those psychological functions intimately related to physiological conditions are prone to suffer decrements as the body wears out. The most obvious changes are those associated with visual and auditory acuity. Many of the deficiencies in

\*From Gilbert, J. G., "Memory Loss in Senescence," *Jr. Abn. & Soc. Psych.*, 1941, 36, 73-86.

these areas have been at least partially corrected by the use of lenses and hearing aids. Nevertheless, for a variety of reasons, many seniles have failed to take full advantage of the help thus provided.

Moreover, it is possible that there is still a residual age change in visual perception that medical science cannot overcome. The evidence for this statement comes from a study by Price, who tested a group of subjects ranging in age from six to eighty-nine. Each was seated before an exposure apparatus that presented for a fraction of a second a wide variety of materials, such as letters, numbers, short sentences, colors, groups of lines, and incorrectly written common expressions. The score on the test was the number of items correctly observed. The subjects wore glasses if they were in the habit of doing so for reading. The rise of the score in childhood and early adolescence was characteristically rapid, reaching a plateau from twenty-seven to -nine years. From that point on, the decline in average score was gradual so that individuals seventy to seventy-four years old performed on the average about equal to children eight to nine years old. Those above eighty scored below children six to seven years old.<sup>6</sup> It is apparent that even with corrective lenses "speed of seeing" decreases rather rapidly beyond sixty.

A decrease in sensitivity to internal pains has been reported of old people by some medical observers. Miles quotes such authorities, pointing out how "often severe thoracic or abdominal disease exists in the aged without pain; an extensive pneumonia or peritonitis can be entirely unsuspected; minor surgical operations and dental extractions can be carried out with but little pain and discomfort."<sup>7</sup> The roughening of the skin and the concomitant interference with tactile sensitivity may likewise produce impaired acuity to surface stimuli.

Extensive anatomical taste-bud censuses have been made on humans from birth to eighty-five years of age.<sup>8</sup> The findings indicate a very rapid increase in their number after birth, remaining at about 245 until twenty years of age. From that time onward the number decreases until in maturity and early old age the mean value is about 208. For ages seventy-four to eighty-five the average number of buds is about eighty-eight. Although there is no direct information on taste acuity in relation to age, these anatomical

studies would lead us to expect some decline in taste discriminations.

In general, the changes in perception are all inclined to isolate the aging person from contact with his objective world. He does not see, hear, taste, or touch his surroundings with the same acuity he once experienced. His senses are more likely to deceive him. Consequently, unless measures are taken to socialize the individual he is likely to retreat to an inner world of self-absorption and memory. His failing senses play an important part in his adjustments.

### *Drive and Motivation*

Much speculative and some factual material has been written concerning the sex drive in late maturity and early senescence. The menopause in women, occurring usually during the late forties, definitely marks the end of reproductive powers. For men there is no such clearly defined period dividing the later stages of life. However, men unquestionably retain their reproductive powers for years beyond the average time of menopause in women. In spite of these physiological changes, there is no necessary decrease in the sex urge in either men or women. Indeed, there is in some seniles a phase of behavior known as "sexual recrudescence" which may express itself in foolish infatuations for younger persons of the opposite sex or in more direct forms of sexual behavior. In early senescence it is not uncommon to find persons experiencing short periods of intense erotic desire separated by longer spells of frigidity and impotence. The extent of such erotic flairs and the precise reasons for their existence are still shrouded in some mystery.

It has been suggested that the individual approaching the end of his maturity may try to hold off the inevitable period of less active life by a final, glorious, uninhibited fling. The resurgence of sexual interest is perhaps a part of this effort to drain the last drop of enjoyment of vigorous maturity. In addition to this suggestion, is the possibility that renewed sexual activity may come about through a change in attitude. During the earlier years sex expression is often viewed as dangerous, but with the onset of sterility and greater familiarity with the consequences of sexual

activity, the individual may become bolder and more impervious to the attitude of others. G. Stanley Hall, one of America's outstanding psychologists of the past generation and one of the first to call attention to the special psychology of senescence, expressed his opinion of morality in old age in these words:

Versus "Be sure your sin will find you out," all the old realize that they have done much sin that is not found out and which if it were exposed, would bring suffering, disgrace, public execration, and loss of vocation, property and friends. To fear only the consequences of evil is bad, and since they have escaped they feel a certain contempt of secular and moral law and take greater risks. The old man prefers to be respectable and righteous, but he does not care if his unrighteousness is known or suspected if it is not made too public. Thus the old dread exposure more than they do sin.<sup>9</sup>

This change in the sexual drives of older people often presents an unusually difficult adjustment problem because many experience the change at the time when they have expected a steady decline in sexual vigor. Adolescence has often been pictured as the period of storm and stress because of the appearance of new and strange impulses. Probably early senescence is more correctly called the "dangerous age."

It was suggested in connection with the discussion of learning and memory in seniles that disuse of the functions may account for at least some of the decline in such abilities. Often another of the contributing factors to the rigidity of age is the lack of any drive or interest to gain new insights, additional skills, or different habits. For many old people a change presents a hazard. Their habitual modes of action and thinking have brought them some degree of satisfaction and perhaps success. In later years there is not sufficient time to experiment; to reshuffle one's behavior patterns in the hope of finding a more satisfying combination. In addition, physical vigor and endurance is depleted so that little surplus is left after the normal demands of bodily maintenance are satisfied. Even mental activity requires some physical effort, with the result that old people frequently cannot, if they would, maintain the pace of thinking that characterized their youth.

It has been observed that old people tend to grow careless of their appearance, slovenly in their habits, and often gluttonous in

the satisfaction of their more sensual pleasures. These characteristics apparently reflect a growing egocentricity related to depleted drives for social approval on the one hand and, on the other, to the social isolation produced by failing sensory acuity. These features of seniles would seem to contradict the generalization given earlier in the chapter that the essence of age is intellect. There is no necessary contradiction, provided we remember that the principal defects of age are physiological and the gluttonous behavior of seniles is related to their introversion—a common feature of intelligent college professors.

In summary, with the exception of sex urges which follow an erratic downward course the principal motives of old people appear to decline gradually. Any discussion of motives in old people is handicapped by a regrettable lack of precise studies, and depends heavily in this section on the opinions of unsystematic but penetrating observers.

### *Creative Ability*

It has sometimes been claimed that late maturity and early senescence, when the individual has accumulated a rich fund of experience, are the years during which the great, lasting contributions to human knowledge and culture are made. Illustrative cases can be cited by the score to support this proposition, as well as the opposed notion that youth is the time of greatest creative production.

Happily, this point need no longer be argued with collected individual cases. Lehman and his associates have reported a series of illuminating systematic investigations of the ages of the important contributors in medicine, literature, mathematics, astronomy, chemistry, and the related fields. The period of maximum productivity in every field so far studied is at some time earlier than the fiftieth year. That is to say, if one collects the outstanding discoveries and contributions in a given field of science or art and then unearths the age of the authors of these contributions when they were announced, one will find the greatest number of contributions were made at some age period before fifty. The following pair of figures shows for four areas the rapid rise of creative productions in early maturity, followed by a gradual decline with a secondary

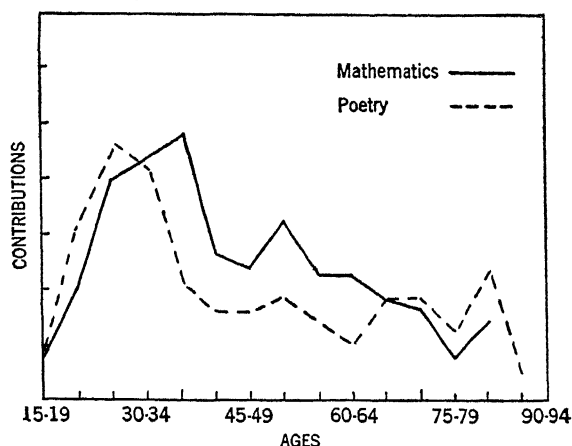


Figure 4. Showing Number of Original Contributions Made at Various Ages by Prominent Mathematicians and Poets. Adapted from H. C. Lehman, "The Creative Years," *Scientific Monthly*, 1936, 43, 151-162; 1941, 52, 450-461.

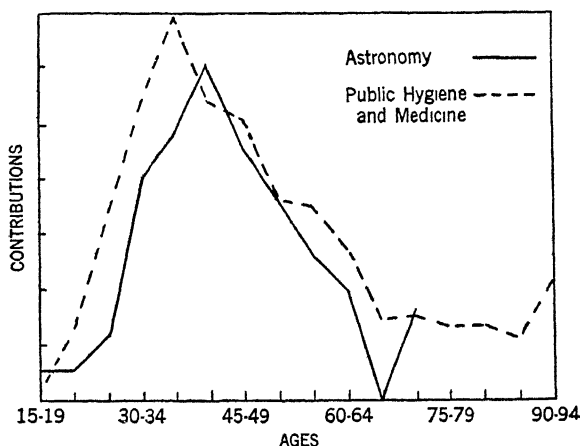


Figure 5. Showing Number of Original Contributions Made at Various Ages in Astronomy, Public Hygiene and Medicine. Adapted from H. C. Lehman, *op. cit.*

peak in some cases occurring in early senescence.

The above curves, it must be noted, are not necessarily representative of an individual's creative ability, although they may be. These curves are based on group data and may in some respects differ from curves showing the number of contributions made by

a single individual during his lifetime. The next figure shows the number of patents secured by Thomas A. Edison during each year of his life. Even though he was most active during his early adult years, senescence found him still producing creative work.

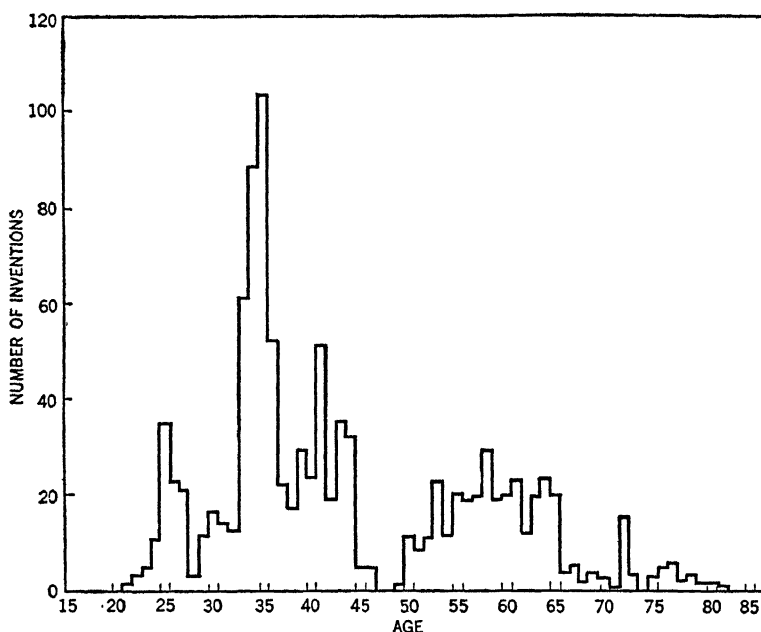


Figure 6. Showing Patents Obtained by Edison at Various Ages. Redrawn from H. C. Lehman, "Creative Years in Science and Literature," *Scientific Monthly*, 1936, 43, 151-162

The meaning of Lehman's studies for adjustment may not at first be apparent. Age is not a period when originality and creative ability are at their maximum. On the other hand, it is not a period when the individual who has actively participated in creative work need close his books and lock his laboratory. Important creative work is still possible for men beyond sixty. It may be that during retirement, when much of the necessary routine of a livelihood is set aside, the individual may find sufficient time for the tasks he had to neglect formerly. Perhaps the decline in the number of creative productions noted by Lehman is merely a reflection of declining drives rather than an actual decline in creative ability.

It has been pointed out in this section that intelligence, learning

ability, memory, and creative productions decline slowly during maturity and early senescence. The precise extent to which these functions are the necessary consequence of degenerative biological processes is still debatable. However, it is known that the rate of decline is influenced by the strength of drives and motives often subject to control by the individual. Sensory acuity and speed of action appear to be more directly dependent upon physiological degeneration. Decline in these functions often complicates adjustments of the aged, since failing sensory acuity tends to isolate the individual at a time when socialization is important.

This brief review of the capacities of seniles leaves one outstanding last impression. The aged in good physical health need not feel condemned to inactivity or sterile mental exercise. One of the chief obstacles in the way of attaining satisfactory adjustment in the late years of one's life is a pessimistic superstition that age is decrepit, inactive, worthless. Persons with that attitude justify the belief by acting the part. There may, however, be other attitudes.

### 3. THE ATTITUDES OF OLD AGE

The passage from late youth to middle age has many of the same traits as growing old. We suddenly realize, perhaps in a flash, that life is no longer all before us. When youth begins to die it fights and struggles. The panic is not so much that we cannot do handstands, but we have to compromise with our youthful hopes. We have been out of college perhaps twenty years. Napoleon lost Waterloo at forty-five, Dickens had written all his best at forty, and Pepys finished his diary at thirty-seven. We lose the sense of superfluous time and must hurry. We feel the futility of postponements and accept the philosophy of the second best as not so bad. We become more tolerant toward others and perhaps toward ourselves.<sup>10</sup>

In these words Hall described one of the principal changes in attitude that comes with age. When one approaches retirement he looks back over the years of his life and tries to evaluate the time and effort spent. One may realize quite suddenly that he has not attained his youthful ambitions. The outstanding people in ones profession may have represented the individual's ideal of accomplishment. Now that time is short the old man may recognize he



will not be another Justice Hughes or a Dr. Mayo, or a Marshall Field, or a John D. Rockefeller. Life has been a series of half accomplishments in terms of youthful aims. And then after contemplating the past with a tinge of regret and disappointment one may turn his attention to the very short future, which is likely to be filled with more aches and pains than the past. Little wonder that age is often a period of pessimism.

Roy Helton has aptly termed this change in attitude "the decline of newcomer enthusiasm," a feature familiar in all fields where experience is less important than willingness to endure punishment for some prized goal. Among the aged, those who have experienced some defeat, some disappointments and humiliations, newcomer enthusiasm rapidly declines. There is less willingness to take a chance, less optimism, less buoyant faith in an all too-short future. They cringe from making plans even to fix up the garden or visit the relatives next summer. The attitude is well expressed by a retired farmer who said, "My gosh, what's the use? Ah cain't do nothing."

The commonly observed interest of old people in death, funerals, and cemeteries is, however, not necessarily part of a morbid pessimistic attitude. A friend of the author's drove his grandmother on an extensive auto trip and noticed her frequent comments about the cemeteries they passed. Another grandmother was observed to make frequent reference over a period of months to the funeral she had attended. Without special inquiries she voluntarily recited at various times a great many of the details which would have escaped the notice of younger people. Such an interest in death is entirely in keeping with a normal attitude. In youth we look forward perhaps to building a home of our own. In traveling about we tend to notice new houses. In visiting our friends we observe details of floor plan, construction, location, new developments in lighting, and heating. Such things are at least potentially a part of our near future. For the old person, death holds a similar position and it is only natural that he should calmly project himself into that future.

The fear of death is sometimes much overrated by persons far removed from it. Sir William Osler made a careful study of some five hundred persons on their death beds. He stated that about

ninety suffered bodily pain, eleven showed mental apprehension, two were positively terrified, one expressed spiritual exaltation, and one suffered bitter remorse. "The great majority gave no sign one way or the other; like their birth, their death was sleep and a forgetting." <sup>11</sup> Death is obviously a mystery for all; but for most it is apparently not a terrifying mystery.

Retirement from active life because of arbitrary age limits frequently brings in its train very rapid deterioration. Men particularly are forced suddenly to break off their business or professional life simply because the clock has caught up with them. The aging woman can continue her sewing, embroidery, some of the housework; but a retired businessman has little he can do but read, listen to the radio and daydream. The inactive, retired individual often grows old dangerously fast. Yet why should inactivity and rest, ordinarily recommended to recoup one's energies, reduce the physical vigor of old people? The answer lies in the attitudes often assumed by seniles toward themselves.

George Washington at the age of twenty-six, having retired from command of the Virginia militia before the close of the French and Indian War, wrote, "I have now too much reason to apprehend an approaching decay." And a year later, "I hope to have more happiness in retirement than I ever experienced amidst a wide and bustling world." After seventeen years of this retirement he was recalled, against his will, to command the Continental Army. "I this day declare with utmost sincerity I do not think myself equal to the command I am honored with." Washington's brilliance returned with the strenuous demands of his task. He became a distinguished soldier, but in 1783, at the age of fifty-one, he wrote, "The scene is at length closed. I will move gently down the stream of life until I sleep with my fathers." A little later, "Heavy and painful oppressions of the head, and other disagreeable sensations often trouble me." "(I am) descending the hill I had been fifty-two years climbing . . . soon expect to be entombed in the mansion of my fathers." In spite of his failing health, more prominent in retirement than in active life, he was again drafted for eight years as president during the nation's critical early years.<sup>12</sup>

The example of Washington is only one which might be cited

to show that retirement often brings with it physical ill-health. The duties of office, the appetites for the rewards of labor, the competition of work, all direct attention outward away from one's self. When these are removed, without substitutes, attention is directed inward. As Helton aptly puts it, "The inactive senile fondles his interior arrangements with anxious imagination" His liver, stomach, and kidneys are carefully examined and invariably found disorganized (by himself). There may, of course, be some truly important organic defect, but too much amateur diagnosing and drugstore doctoring, to which the old easily become addicted, might readily be avoided if attention were focused outward rather than inward. Inactivity encourages ill-health.

Extreme cases are sometimes reported that illustrate the extent to which inactivity in forced retirement may affect one's health.

An executive was compelled to resign his position after a very active life because of the age limit. He had up to this time been in perfect health. As soon as his private telephone to the firm was removed from his home, a symbol of his connection with it, he went into a quiet depression. He chafed against the inactivity, but his sufferings took no very articulate form. The problem was not economic because he was retired on three-fourths pay, enough to meet all his obligations. And now the mysterious thing began to happen. First, he acquired meningoencephalitis from over-indulgence in alcohol. Two months later he developed a cancer, had a radical operation, and finally died of esophageal varices within six months of retirement.<sup>13</sup>

An aged person's physical health exerts a very important influence on his entire adjustment. Physical handicaps, in addition to impaired sensory acuity, interfere with one's work and recreation. Rheumatic joints not only make it more difficult to maintain one's former pace on the job, but may prevent the individual from participating in many light forms of recreation from which he formerly derived considerable pleasure. A study of nearly four hundred old people more than seventy years old in upstate and metropolitan New York revealed the relation of health to happiness.<sup>14</sup> The information used to classify these people as to happiness and health was obtained by use of questionnaires and personal interviews. The following table compares the groups and reveals in general that the happiest are those who are healthy. (Health

scores are based on an elaborate system of points assigned to answers on the questionnaire.)

HAPPY  
URBAN



AVERAGE HEALTH SCORE



UPSTATE



UNHAPPY  
URBAN



UPSTATE



Figure 7. Showing the Relation Between Health and Happiness Among Elderly People.

The same study went on to correlate the "happiness" and health scores and found that for women the coefficient is  $+.29$  and for

men +.43. The conclusion drawn from these figures is very significant in light of the fact that men are often compelled to cease their occupations more abruptly than women. The coefficients suggest that while good health is an important factor in the happiness of old people, it appears more important to men than to women. Aged men, suddenly shorn of the responsibilities of making a living, and less interested in other things, apparently are more likely to become unhappy when illness overtakes them.

Recent political pressure exerted by the older sections of our population points up another attitude that has probably existed for a long time but has remained submerged by the numerical dominance of youth and maturity.

Western, and especially American, culture is primarily designed to serve youth. Our schools, transportation facilities, literature, amusements, religious emphasis, even the majority of our homes, are planned to serve youth, not old age. Many business concerns and educational and professional institutions slough off the aged automatically at sixty, sixty-five, or seventy, regardless of ability. Even the shortsighted practice of hiring none over forty was gaining favor just before World War II. The accent is definitely on youth.

Few criticisms cut deeper into human pride than the charge that one is useless. Surrounding the aged on all sides are subtle yet pointed implications that they do not fit in this world; that they are worthless parasites incapable of contributing to the common welfare. It is not surprising, therefore, that the aged should turn this widespread yet unwitting suggestion into political capital in demanding liberal cash doles. The popularity of such schemes can in part be traced to the fact that they raise the aged to a level of economic and social importance not previously attained and yet do not conflict with the stereotyped conviction that old people are incapable of important productivity. The schemes hold promise, moreover, of reversing the common adage that youth must be served. The political shuffling of old-age groups has called attention to their feelings of insecurity, inferiority, and worthlessness in a world dominated by youth.

The attitudes of old people are profoundly influenced by their physical health, by their decreasing participation in the active affairs of their vocations, by the prospect of a short and uncertain

future, and by the ever-present suggestion that they are of little use to society.

#### 4. PROVISIONS AIDING OLD-AGE ADJUSTMENTS

The preceding sections have dealt with the capacities and attitudes of old people. The attempt has been made to picture the aged as they usually are. It remains now to consider some of the factors that affect adjustment in old age. What can youth and maturity do to make the present generation of aged folk less of a problem? How can friction and discord be minimized?

##### *A Job*

As has already been pointed out, many of the difficulties of senescence stem from the inactivity of the aged and the suddenness with which boredom settles upon them. The cantankerousness and irritability of many old people is a reflection not only of their more pessimistic attitude but also of their distaste for their seeming "unnecessary" role in life. The obvious remedy for this condition is some form of activity that does not tax the individual's declining physical vigor.

One sour old man, seventy years of age, of considerable means and energy, was a source of much bitter strife in the home of his son. His wealth consisted chiefly of a block of canning-company stock. It was suggested that he might enjoy a visit to some of the orchards, farms, and plants which he had never seen and which belonged to the corporation. The first trip altered his entire outlook on life. He was soon making trips to other farms, became interested in farm problems, made intelligent and helpful suggestions on management, and asked innumerable questions about agriculture and the canning processes. One of his tours took him as far as Panama to investigate transportation problems of the industry. The new channel of interests drained off his energies so that he ceased to be a grouch around his home.

The prevalent practice of setting arbitrary age levels for retirement is not always conducive to good efficiency in business nor to good adjustment for the individual. A much sounder procedure would take into consideration the actual ability of the candidate for retirement and adjust his duties accordingly, so that the break

between having a job and not having one would be less abrupt. Gilbert has studied the mental efficiency of persons sixty to sixty-nine years of age by means of the Babcock test, which uses vocabulary as the measure of original intellectual level, and a series of other tests involving timed recall of older learning, motor ability, new learning, various types of memory and retention, for the efficiency phase. The discrepancy between the scores on the two types of tests is involved in computing the efficiency index. Gilbert found a highly significant difference in the efficiency index of those who were employed, compared with those unemployed, the difference being in favor of the employed group.<sup>15</sup> Possibly those who have successfully resisted the effects of age have managed to hold their jobs because of this fact. On the other hand, the leisure of unemployment may have accelerated the decline in efficiency.

Most people like to work, or at least do something. As one painter over seventy expressed it, "If I was worth a million dollars, I'd still want to get around and do something." More than two-thirds of the people from the lower and middle-income groups receiving old-age assistance and questioned by Morgan in her study of attitudes, evidenced an enthusiasm for work. The positive attitude, moreover, was more frequent among the well-adjusted than among those who were unhappy and bitter.<sup>16</sup>

The range of possible forms of action for the aged, in reasonably good health, is not so limited as one might think. One grandmother takes over her daughter's house one day a week. She does the marketing, plans and serves the meals, makes the beds, and does all the other necessary chores without consulting her daughter's family. Others have found in weaving, handiwork, toy-making, mechanical tinkering, and gardening, outlets for their thwarted interest in work. There is no necessity to compete with established industry in any of the useful things that the aged may do. There is always a demand, even in a machine age, for the products of skilled handicraft. A pair of retired school mistresses have developed a profitable sideline for themselves and brought activity to others by running a summer "patchwork" shop along a tourist route. Their wares are made by country folk who in many cases still retain the needlework touch not duplicated by mechanical mass-production methods.

One of the best antidotes for the shelved, discarded, burdensome feeling common to persons in their sixties and beyond is some form of useful activity. The pleasures of life come in living it, not in contemplating it from the sidelines. Approximately half of the people interviewed by Morgan in the study already referred to, reported their happiest years were between twenty-five and forty-five, when they were most actively engaged in the adventures of building a home, earning a living, rearing a family.<sup>17</sup> There was a point to action then. Mere "boondoggling" is no more satisfying to the aged than to youth. Some imagination must be used to discover, within the range of the older man's ability, a task of importance that will keep his mind directed toward the future and away from himself or the minor irritations that may easily become magnified.

### *Privacy and Independence*

A degree of privacy is an important contributing factor to good adjustment in the aged. This condition is not always easy to provide in urban communities where a "spare bedroom" means additional rent. The precise degree of privacy is, of course, difficult to define because it varies with the individuals concerned. In some instances even the spare bedroom is not sufficient, particularly when well-intended grown children try to "take care of" their parents.

I have in mind a once charming old lady, who had lived all her life in a small western town, prominent in social and religious circles. After her husband's death she continued to live at home with an old servant rather than move to her only daughter's home in another state. A close and affectionate relationship between Mrs. Smith and her daughter and son-in-law made the usual reunion at holiday times delightful. As the grandchildren arrived, two girls and a boy, there was added joy. The daughter, however, kept trying to persuade her mother to give up her home and live with her for her own peace of mind. The mother resisted until after the servant's death. But finally, although she wanted to live in an apartment hotel with some of her friends, her daughter won her over and she moved away from all her familiar surroundings.

At first, things went smoothly. It was delightful to be with the children and the daughter's friends were most attentive. Mrs. Smith tried to find her



place in church work, but the ways here were "different." After the novelty wore off she found it difficult to accustom herself to the children and their friends. She read and did some crocheting, but these did not keep her busy or interested enough. More and more she was left to herself, for her daughter's activities took up most of her time. She began to brood. She developed a critical attitude, scolding her daughter for going out so much, for giving the children so much freedom, and so on. She was curious about everything and gradually developed suspicions, particularly after her hearing began to fail. The old lady changed in appearance too—once a stylish, well-dressed person, she became untidy. Her once happy face acquired a continual expression of bitterness. The happy relationship between mother and daughter vanished. Even the daughter's character has suffered, and she is now the martyr enjoying the commiseration of her friends.<sup>18</sup>

The privacy offered in this home was probably satisfactory enough on the surface but it is evident there was insufficient privacy of action both for Mrs. Smith and her daughter.

Again referring to Morgan's investigation, 68 per cent of the old people questioned were in favor of living alone and less than 14 per cent of those who had children with whom they might have lived actually had come to live with them *of their own free choice*. Commenting on these figures, Morgan says:

Why do so many people prefer to live alone? In the homes of their children they feel unwanted, neglected and in the way. They resent the direction and "bossing" of their children and even more so that of the "in-laws." They do not want to be treated as if they were old and feeble and helpless, incapable of doing the smallest task properly. In their own homes they are independent, free to run their households in their own fashion. This last is very important. Over and over again the difference in the ways of life of the older and the younger generation was mentioned by the subjects. As it was pointed out, the old people cling to their old ways, while to the young people these methods seem old-fashioned, foolish and irritating. Both men and women emphasized the personal freedom and independence that homes of their own gave them, and in addition to this the women were likely to point out that it was better for the younger people also not to have the generations mixed in the home.<sup>19</sup>

A misguided sense of duty is often to blame for much of the family bickering that takes place in homes where grandparents

come to live. Occasionally real unkindness toward considerate elders is to blame. But the more poignant tragedies are those in which honest but poorly conceived efforts to help old people actually cripple their adjustment.

A daughter who married wealth brought her mother from a comparatively simple background into her luxurious home. Before long the elderly woman was steeped in self-pity, but not wholly because of herself. To illustrate: When she was found scrubbing a bathroom floor, her daughter demurred. "Don't tire yourself with that. Let the maid do it." The mother burst into tears, sobbing, "You want to deny me every pleasure!"

An unhappy popular prejudice exists against homes for the aged. Sons and daughters who "send their parents away" are sometimes looked upon as not showing sufficient interest in them or as not discharging their family obligations as they should. Actually, life in homes for the aged is often superior to the unhappy existence forced upon all members of the family in a crowded apartment or a small suburban house. Institutions for the aged are often in a better position to give the proper care than private homes. Efforts are made to provide healthful surroundings and congenial companions. Often there are opportunities to develop interests and useful work under the direction of a trained occupational therapist. Periodical physical examinations are given and remedial measures are promptly taken.

Many family situations are typified by the Lanes, who were fairly comfortable until Mr. Lane's father died and his mother came to live with them. The added burden of the grandmother not only pinched the family budget but forced the four children to sleep in one room. Because she felt the situation keenly and knew she was a problem to her son's family, she remained to herself, rarely leaving her room. She became untidy and her room grew unsanitary with the bits of food from the meals she usually took by herself. After much persuasion on the part of a social welfare worker, the son's family and Mrs. Lane, Sr. agreed to her living in a nursing home. The change in both Mrs. Lane and her son's family was remarkable. Her mental and physical health improved; she took kindly to her landlady's suggestions to tidy her person; she became happy and less given to brooding. More-

over, the son's home returned to normal and even the grandchildren grew fond of her.

Privacy and independence of action are features of living that physical handicaps often take from the aged person. Little is gained when the old are robbed of their freedom prematurely by well-intended, overindulgent relatives.

### *Financial and Psychological Security*

Within recent years much attention has been directed toward the problem of financial security for the aged. Many states have enacted laws providing for some financial aid to old people in need. There is no doubt that financial security is basic to any extrainstitutional adjustment of seniles. Important as it is, financial security is not enough to guarantee a pleasant and wholesome adjustment in the late years of one's life. It is quite possible that if those over sixty had received \$200 per month as advocated by the Townsendites, few personal problems would have been solved and many surely would have been created.

Freedom from worry and anxiety is probably as important as financial security. We have already touched upon the fear of death as reported by Sir William Osler. However, in the early stages of senescence there is apparently greater concern about the impending crisis than is true of those closer to it. Not only is there a fear of death, but old people are likely to be concerned with their children's future; they may regret their own youthful follies, wasted time, injuries to health caused by unhygienic habits. Family relationships, estrangements, concern for the financial welfare of one's spouse or family, constitute some of the common worries in old age. By and large, most of the psychological insecurity of senescence is not caused by reflection on the past but by the pessimistic anticipation of a short future.

Anxious concern for one's future may be dissipated by developing latent interests and active participation in some job as already suggested in the preceding pages. A healthy outlook, free from the corroding effects of morbid introspection, may be a by-product of, rather than a necessary condition for, good adjustment. At any rate, mental strain is relieved, and psychological security is bred in those surroundings where the aged are permitted some responsi-

bility and action but where the pace is in keeping with their retarded speed of action.

### *Recreation in Old Age*

In youth and maturity people look forward to vacations when they can relax from the mad pace of the work-a-day world and engage in leisure-time activities. In moments of reflection they may look forward to retirement with the expectation that then they can really enjoy living. Regrettably many have found that what promised to be rest and enjoyment proved to be boredom. The recreations of youth are often too strenuous for age. Most games place a premium on speed and motility—factors in which the aged are first handicapped. Few recreations give advantages to those with the kind of experience common to seniles. When one has mentioned chess, checkers, and cards he has nearly exhausted the list of games that are suitable for old people. It is evident that one of the needs in the coming years, when the markets for children's games will be shrinking while those for adult games will be expanding, will be for a wider variety of entertaining recreation for the upper age groups.

A fortunate few aged people have cultivated throughout their lives interesting hobbies that serve as a stabilizing influence. Sports such as hunting and fishing (particularly the latter), interests in stamp collecting and antiques, gardening and crocheting are avocations for some that add to the pleasure and detract from the threat of enforced leisure. Unhappily, the bustle of making a living prevents many men, particularly, from keeping alive an interest in some side line that may run the gamut from sleight-of-hand magic to telling stories to boy scouts and other adolescent clubs.

Morgan uncovered two interesting facts about hobbies among people over seventy. First, only about one-third (35 per cent) of the people had hobbies at the time of the investigation, but nearly one-half (49.2 per cent) used to have some avocational interest or hobby. Morgan's second important discovery was that poor health, lack of opportunity, and prohibitive expense accounted for giving up hobbies in about three-fourths of the cases. In other words, it seems that many hobbies might be saved if they were developed in

a modified form requiring less physical energy, or others might be developed by intelligent planning in middle life when impediments first make their appearance.<sup>20</sup> The development of hobbies will be further considered in the next section.

### *Pleasant Social and Family Relationships*

The crux of the whole problem of adjustment in old age is found in the relationships established with one's family and associates. A task, some responsibility, extraverting interests, good health, financial and psychological security, recreation, privacy and independence, influence the attitudes and actions of seniles. The adjustment of elderly people is judged in the last analysis in terms of their relationships with those about them. Those who are most content and happy in their declining years are predominately those with pleasant family and social relationships.

The responsibility for establishing a congenial atmosphere must, of course, be divided between the individual himself and other members of the family. The younger and middle-aged persons must make allowances for the greater fatigability, slower speed, declining drives, marked conservatism, and increasing sensory defects that characterize most old people. At the same time, the younger members of the family must learn the art of persuading the old people to continue their interests or develop new ones closely related to those that must be foregone because of physical handicaps. On the other hand, the old people themselves must meet the situation at least halfway. They must recognize that respect for age must be earned and is not due them solely because they have evaded successfully the microbes and hazards that proved the undoing of their less fortunate friends.

Extreme conservatism which ineffectively blocks progressive change is not a necessary consequence of biological degeneracy. It is evidence of psychological aging that can be avoided, to some extent. There are at least two extreme kinds of old people. Some live in the past, dreaming their dreams of early success; repining and querulous with the present and future. Others have the opposite traits, are vitally interested in the present, making plans for the future, mellowing their judgments with the wisdom of their experience. The very existence of these two kinds of old

people is good reason to believe that more of the latter and fewer of the former can be developed, provided the proper educational, social, and cultural changes can be made.

## 5. PREPARATION FOR OLD AGE

Some years ago a prominent lady asked Dr. John Dewey, one of America's foremost philosopher-educator-psychologists, for references in literature to the psychology and sociology of growing old. When he was compelled to admit his ignorance, she remarked, "It is strange that the one thing that every person looks forward to is the one thing for which no preparation is made."<sup>21</sup> Even when one speaks to older people today about their preparation for age they almost invariably think in terms of financial preparation alone. Few apparently foresee the unique adjustment problems that will confront them at a time when modifications in one's habitual modes of living will be difficult yet necessary. What can be done in advance to relieve the problems that may appear in old age? What preparations other than financial ones can be made for retirement?

### *Physical Health*

The importance of good physical health as it affects one's participation in a satisfying task has already been discussed. There is little need to reemphasize the significance of either the task or good health as they bear on adjustment problems. The avoidable excesses of youth might be less frequent if the consequences in the remote future were made more real.

### *Hobbies and Interests*

Among those who have given thought to the problems of adjustment in old age, there is general agreement that hobbies and a wide variety of interests ought to be developed as preparation for the increased leisure of late life. Information given earlier in this chapter on learning ability in adults indicates that new skills unrelated to those already established in youth are difficult to acquire in retirement. The importance of this fact for old-age preparation cannot be stressed too much. It means that if one is to have a fund of possible activities that will truly dissipate the boredom of retirement he must cultivate suitable interests and hobbies in

advance. Retirement is the time to enlarge or enrich those interests but not to lay their foundations.

Perhaps one of the reasons for the paucity of hobbies and avocational interests in the present generation of seniles is found in the fact that they were forced as middle-aged and younger adults to spend a large part of their day earning a living. The overexertion demanded by their occupations left little or no time and less energy to be spent on photography, sports, model shipbuilding, or some other diverting task. The working week is gradually and steadily shrinking so that in the future more time will be available for cultivating leisure-time activities. It will be the individual's responsibility to find a task with carry-over values for old age.

Adults of today are much more fortunate than those a decade or so ago because important stimuli exciting wholesome interests are found in the growing emphasis on public forums, hobby clubs, and other forms of adult education. It is recognized now that education does not cease with graduation. Not only is it imperative that adults keep well abreast of current developments to discharge their obligations to a democratic society, but their own welfare demands that they retain as much of their youthful modifiability as possible. The reader will recall Sorenson's finding that those who had recently taken university courses showed less decrement in learning skills than others of comparable age who were resuming their course work after a lengthy absence from university activities. Intellectual exercise, unlike physical exertion, can be continued apparently with beneficial effects for some years beyond late maturity. Continued use of effective study methods favors their retention and permits the individual to learn new skills with greater ease. The available agencies of our culture have provided opportunities for engaging in learning activities that will help postpone senile rigidities.

The range of possibilities open to those who retain the flexibility of youth is revealed by a great number of individual cases. People past sixty have learned typewriting, to fly airplanes, to speak foreign languages. A lady of eighty-one took a course in astronomy; a retired woman mathematics professor became a corsetière. A retired businessman in a small town established a one-man Better Business Bureau to show up rackets and tricksters of all

kinds. One college president became an authority in his later years on early American silverware. Another learned to play the cello and gave a public recital; later he learned etching and had his work hung in prominent galleries.

One of the fundamental ways of preparing for old age is to lay the foundations in maturity for hobby interests or retain a youthful plasticity through the frequent exercise of learning functions.

### *Flexibility of Attitudes*

The importance to mental hygiene of a certain flexibility of attitudes was discussed in the preceding chapter (see page 54). Seniles are likely to have a fixity of viewpoint toward the world that regards new developments as disasters. The extreme reactionary conservatism of age does not descend upon one suddenly but grows by gradual insidious steps. It may first show itself by disapproval of modern dress, a preference for last year's auto styles, or a rosy nostalgia for one's early college days. The signs of conservatism ought to serve as warnings. Not that conservatism is to be avoided at all costs, for certainly not all things modern are necessarily progressive or good. But conservatism which serves merely to justify an unwillingness to adjust to a changing world ought to be carefully scrutinized and discouraged. The inexorable course of civilization does not permit one to live comfortably if his attitudes are fixed in the patterns of his youth. Even the teachings of religion are undergoing a constant, if slow, reinterpretation.

How can one retain a pliant, flexible outlook? Two concrete suggestions can be offered. First, the mature person may cultivate friendships and acquaintances among those who are younger, taking the place of those who are lost by death. Active association with younger people will unquestionably help in understanding their point of view. Second, the mature person must remember that the mere accumulation of years does not automatically bring with it wisdom and veneration. The scientific point of view which places value on demonstrable rather than ex-cathedra statements has permeated social thinking. Pronouncements of "old wise men" are no longer accepted in preference to contrary but verified statements from others, regardless of their age. Recognition of this scientific attitude and the willingness to weigh objectively one's



own opinions in the scales of fact will do much to retain a progressive point of view.

## 6. THE FUTURE OF OLD AGE

A psychologist is not ordinarily a prophet. However, at the risk of seeming to step out of the usual role one or two possible developments may be suggested to take advantage of the virtues of age.

It is entirely possible that society in the future may come to recognize more fully the wisdom of salvaging rather than shelving seniles. The experience of businessmen, lawyers, physicians, teachers, mechanics, engineers, and others is often lost at the tick of a clock. Information presented in this chapter indicates that people differ widely in their capacities at different ages, so that some have outlived their usefulness at fifty and others not until they have passed their seventieth or eightieth birthday. The principle of uniform retirement age for a given organization may have a certain justice to recommend it, but it certainly disregards the fact of individual differences. Possibly the future may find tests for retirement as commonplace as are tests for employment.

Moreover, one of the factors rendering adjustment difficult, especially among men, is the suddenness with which they are often forced to revise their living habits. Retirement often adds eight or ten hours to their day, forcing them quickly to find new outlets for their energies and time. It is entirely possible that industry could find tasks within each establishment demanding only part of a day that would perhaps serve as an exit job, enabling the man to make his adjustment gradually. With the proper kind of foresight and development of employee morale such tasks could be looked upon as promotions rather than as demotions preceding a disgraceful discharge.

The future will also undoubtedly witness a greater use of advisory councils composed of men retired from their vocations and relieved of executive duties. Such councils would tend to preserve for use the accumulated experience of the elder generation. Where boards of experts for consultation exist today they are often composed of executives, research men, production managers, or educators who are themselves actively engaged in work. Their

productive time is sapped by the advisory duties which could, in some cases at least, be more profitably obtained from those who are still vigorous but too slow for the fast pace of the business world. In athletics the principle is readily accepted that older men, themselves unable to play, can profitably teach others the skills of the game. A role similar to the coach's would be played by advisory councils in business and industry.

## 7. SUMMARY

The survey of adjustment in old age has emphasized the capacities, attitudes, and problems of people over sixty. There is a decline in function, particularly in those psychological processes closely related to physiological conditions. Part of the recorded decline in psychological functioning is unquestionably traceable to attitudinal factors. The folklore of Western civilization has tended in some cases to maintain these attitudes which are without factual support.

Conditions that favor a wholesome, contented old age are: (*a*) a satisfying task, (*b*) a degree of privacy and independence, (*c*) financial and psychological security, (*d*) adequate recreation, and (*e*) congenial social and family relationships. In the light of these necessary conditions and the capacities of old people, it is obvious that some preparation is necessary if one expects the late years of his life to be reasonably content. That preparation consists largely of developing a variety of interests with carry-over values to senescence and a flexibility both in skills and attitudes that will make the process of readjustment to the ever-changing world a less difficult one.

Finally, greater provision will probably be made in the future for preserving and using the experience of old people after they have been relieved of the tasks of maturity.



### 3. PSYCHOLOGY APPLIED *to Industry*



# Chapter 6

## EMPLOYMENT PSYCHOLOGY

Employment procedures in the past three decades have undergone a transformation. In a previous generation men were hired at the factory gates by a foreman who often knew personally a large number of the applicants. As concerns grew in size and applicants grew in numbers, the task of employing men grew in complexity. The quick, hurried decisions of the foreman have given way to a more lengthy painstaking process.

The reasons for this shift of responsibility from the foreman to an employment specialist are two. First, management has increasingly realized that a large number of its problems are human problems which can in some measure be avoided by hiring not simply strong, willing "hands," but personalities who shape themselves to the special demands of their jobs. Second, cost accounting of labor turnover revealed some astonishing figures. The Dennison Manufacturing Company, for one, reported that every new man cost them \$80 before he reached average production. The Milwaukee Electric Railway and Lighting Company, for another, estimated each new trainman cost them \$217.<sup>1</sup> These costs include training, wear and tear on machinery, reduced output, spoiled work, accident hazards, as well as the direct expense of an employment office. Management's logic in this situation has been that a carefully planned employment procedure will sift out the applicants who will adjust best to their work, thus reducing the number of failures and the resultant costly labor turnover. In this effort to find better employment techniques the psychologist has made important contributions.

The development of objective psychological devices for employment purposes has not always met with a ready acceptance on the part of industrial managers. As one surveys the short history of

these efforts he is impressed with the fact that management has too often accepted pseudoscientific techniques in preference to the more laboriously established devices suggested by scientists trained in the precise methods of the research laboratory. Management's desire for quick dramatic results has played into the hands of the charlatan who judged character and proficiency by the cut of a man's chin, his hat size, the color of his hair, or the bumps on his head. Careful investigations have clearly demonstrated that graphology (analysis of handwriting), physiognomy (reading character from facial features), astrology (discovering character from knowledge of birth dates), and palmistry are for these purposes worthless.

In spite of this fact, a number of enterprises still place unwarranted faith in employment devices that are quick, easy, and dramatic. A recent survey of twelve commercial organizations revealed that nine were favorably disposed to the use of graphology in selecting employees. For example, the president of a construction company wrote:

Graphology, when in the hands of such an experienced and ethical person as —, takes its place with any of the sciences.

We feel we have saved money in being guided by graphology when employing help. In the case of temporary employees who have to handle large sums of money, a handwriting check-up is as good as a surety company check-up, where time is limited.<sup>2</sup>

This is not the place for a detailed criticism of graphology. However, one representative study showed that professional graphologists were only slightly better than college professors and college students in matching ten character sketches of adult men with samples of their handwriting. While the average number of correct matches of handwriting with the personality descriptions was slightly better than chance, this study, like others, provides no basis for believing the method is sufficiently dependable for employment purposes.<sup>3</sup> Anyone familiar with the controlled observations on graphology would certainly place less faith in it than is expressed by the quotation above.

In citing this survey of twelve companies there is no intention to convey the notion that three-fourths of our commercial concerns

use pseudoscientific methods of employment. Another similar study, made in 1936 of two hundred concerns in Connecticut and western Massachusetts, revealed only two admitting the use of some system of questionable scientific value at some time prior to the survey.<sup>4</sup> Fortunately, the self-styled "character-analyst" is less often welcomed by management than in previous years.

Concisely stated, the objective of employment devices should be the discovery of the individuals best equipped to meet the demands of whatever job may be available. Such an objective assumes first, that the detailed characteristics of the job are known, and second, that it is possible to measure the abilities of applicants. The basic task of the employment specialist is, therefore, twofold: he must analyze jobs and analyze people. A third aspect grows out of these other two which often overshadows all else. The employment manager must demonstrate in clear (usually statistical) terms the validity of his methods. That is, he must be able to show how well he is selecting employees. These three main functions of the employment specialist will run throughout the discussion which follows. It will consider the principles and some of the techniques in analyzing jobs, discovering good and poor employees, interviewing applicants, and evaluating potentialities and skills.

## 1. ANALYZING JOBS

A job analysis is a description of what a workman does, the surrounding factors affecting his job, and the features of the workman that are important determiners of his efficiency. Such information must be in the hands of the employment interviewer before he can draw any conclusions about the fitness of his applicants. The hackneyed observation that selection is a process of fitting pegs into holes presupposes some knowledge of the size and shape of the hole as well as the peg.

A comprehensive job analysis includes the following items, each amplified to a greater or lesser degree, depending upon unique local conditions.<sup>5</sup>

1. Identification of the job, industry, branch, alternate titles
2. Number employed
3. Statement of duties



4. Machines used
5. Analysis of operations
6. Conditions of work (hazards, physical surroundings)
7. Pay and nonfinancial incentives
8. Relation to other allied jobs (place in organization)
9. Opportunities for transfer and promotion
10. Time and nature of training
11. Personnel requirements (minimum and optional)
  - a) general, e.g., age, sex, nationality, marital status
  - b) physical
  - c) educational
  - d) previous experience
  - e) general and special abilities
  - f) temperamental and character requirements
12. Special advantageous or disadvantageous features
13. Employment conditions

### *Methods of Analysis*

Most job analyses in practice are somewhat less complete than this list of items would suggest. The features which are amplified, however, vary from one situation to another. For example, the Occupational Research Section of the United States Employment Service has adopted the form given on page 159 for describing item 11f in the above list. Ratings on this form represent only one small part of the complete analysis, but fortunately the form has proved reasonably satisfactory in delineating jobs. Compare, for example, the ratings made for a cherry pitter with those made for an airport clerk.<sup>6</sup>

Items Rated B or A	
<i>Cherry Pitter</i>	<i>Airport Clerk</i>
Work rapidly for long periods	Memory for details
Dexterity of fingers	Memory for oral directions
Dexterity of hands and arms	Memory for written directions
Eye-hand coordination	Arithmetic computation
	Intelligence
	Ability to make decisions
	Initiative
	Attention to many items
	Tact in dealing with people
	Memory for names and persons
	Personal appearance
	Concentration amidst distractions
	Emotional stability
	Ability to meet and deal with public

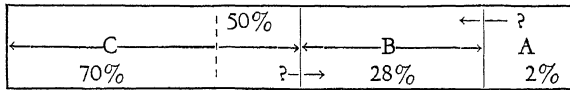
WORKER CHARACTERISTIC FORM<sup>8</sup>

Job Title \_\_\_\_\_

Schedule No. \_\_\_\_\_

Indicate the amount of each characteristic demanded of the worker in order to do the job satisfactorily by putting an X in column A, B, or C.

## RATING SCALE GUIDE



## GENERAL POPULATION 100%

In checking these items, think of persons in general rather than workers in this job department, or plant as a whole.

Consider each characteristic carefully before rating it. When in doubt between A or B amount, always rate the characteristic as B; when in doubt between B or C amount, always rate the characteristic as B. Thus the significant characteristics of the job will not be submerged in the C column but will be focused more clearly in the B column.

If some characteristic is demanded which does not appear in this list, write it in and check as described above.

Amounts of Character- istics	Characteristics Required of Worker	Amounts of Character- istics	Characteristics Required of Worker
C B A		C B A	
	1. Work rapidly for long periods		29. Ability to make decisions
	2. Strength of hands		30. Ability to plan
	3. Strength of arms		31. Initiative
	4. Strength of back		32. Understanding of mechanical devices
	5. Strength of legs		33. Attention to many items
	6. Dexterity of fingers		34. Oral expression
	7. Dexterity of hands and arms		35. Skill in written expression
	8. Dexterity of foot and leg		36. Tact in dealing with people
	9. Eye-hand coordination		37. Memory of names and persons
	10. Foot-hand-eye coordination		38. Personal appearance
	11. Coordination of independent movements of both hands		39. Concentration amidst distractions
	12. Estimate size of objects		40. Emotional stability
	13. Estimate quantity of objects		41. Work under hazardous conditions
	14. Perceive form of objects		42. Estimate quality of objects
	15. Estimate speed of moving objects		43. Work under unpleasant physical conditions (quality)
	16. Keeness of vision		44. Color discrimination
	17. Keeness of hearing		45. Ability to meet and deal with public
	18. Sense of smell		
	19. Sense of taste		
	20. Touch discrimination		
	21. "Muscular" discrimination	Short Med	
	22. Memory for details (things)	Tall	
	23. Memory for ideas (abstract)		46. Height
	24. Memory for oral directions	Light Med.	
	25. Memory for written directions	Heavy	
	26. Arithmetic computation		47. Weight
	27. Intelligence		48. _____
	28. Adaptability		49. _____
			50. _____

In some job analyses a rating form such as that just illustrated is not sufficient. Since the ratings are usually made by men who have never actually worked at the jobs they are analyzing, they sometimes overlook features of importance. Viteles has advocated a short period of work on the job as a means of gaining a perspective from within rather than from without the job itself. Moreover, Viteles has followed his own advice in analyzing a number of jobs with significant results.

From the standpoint of methodology, Charters and Whitley's<sup>7</sup> study of secretarial work illustrates still another approach to job analysis. They interviewed executives and secretaries and obtained a total list of 871 different duties performed by secretaries although no single secretary performed all of them. When this master list of duties was submitted to several hundred secretaries to check those actually performed, it was found that the average secretary carried out 132 different duties. However, only 22 of the 871 duties, or 3 per cent, were duties common to three-fourths or more of the secretaries. This study makes it obvious that a secretarial job is far from standardized, the duties being determined often by the job situation itself. Consequently, even though an employment interviewer may have a general conception of what is required of secretaries, he must know the particular demands in his own organization or even in different parts of his organization if he is to discharge his function well. This illustration points to the necessity of making job analyses even in those jobs where the duties seem obvious.

An illustration of the kind of information resulting from a detailed job analysis is given by the following form adapted from material gathered by the Occupational Research Program of the United States Employment Service.

*Job title:* Slotter Operator

*Alt. title:* Vertical-Slotter Operator; Shaper Operator

*Industry:* Automobile manufacturing

*Branch:* Machine shop

*Dept.:* Tool and Standards

*Plant Size:* Large to very large

*Special knowledge:* None

*Age:* 20-50

*Exper. required on same job:* 1—4 yrs.

*Similar job:* Apprentice machinist

General machinist

Planer operator

*Promotion from:* Machinist helper; apprentice machinist

*Promotion to:* Assistant foreman; shop foreman

*Lines of transfer:* Any other machine operating job in shop

*Seasonality:* Busiest in winter and spring

*Tools used:* Scriber; wrenches

*Personal tools required:* Machinist's tool kit

*Machine:* Slotter

*Special measuring devices:* Micrometers; caliper; gages

*Accuracy:*  $\pm .0005"$  to  $\pm .008"$

*Work Done:* Operates a slotter to cut slots or grooves in metal stock. Levels and clamps stock to machine table; measures and scribes cuts to be made; selects cutting tool, grinds edge and tightens in slot of vertical ram. Sets ram-stroke speed and length of stroke with adjustment screws. With hand-feed lever, lowers tool to work, starts machine, and makes trial cut. Measures cut and makes adjustments to tool or material. Feeds material up into tool, or horizontally across tool, using hand wheel on table. Oils and greases machine as necessary.

*Surroundings:* Inside, dirty, noisy.

*Materials used:* Metal stock

*Most skill required:* Lay out of work; grinding tools, leveling stock on table; setting tool; feeding tool or material. Must know required speeds for cutting and feeding various metals and tools.

The above information, plus the ratings of worker characteristics given in the preceding form, provides a well-rounded picture of the job and the kind of man required for it.

Summarizing, then, a job analysis for purposes of selection must describe in detail the precise duties and factors involved. The information can ordinarily be obtained through interviews with workers and supervisors, direct observation and rating of the job, or through firsthand experience on the job by the analyzer.

## 2. THE CRITERIA

Closely related to the problem of job analysis is another consideration upon which the efficiency of employment procedures depends. It should be clear that the employment interviewer must not only know the demands of the job but must also have some way by which he can distinguish between good and poor workmen. That is to say, there must be some measure of job performance. In some occupations the criterion or measure of job performance is quite obvious at first glance. Good salesmen, for example, may get more orders than poor salesmen. An inspector of roller bearings may be judged in terms of the number of units

examined per day. Typists may be graded in terms of the number of correct strokes per minute. On most jobs, however, a number of features are available by which the employee's performance can be evaluated. In a study of department-store salespersons, a total of seventeen criteria were available, among which were number of sales, average amount of sale, value of merchandise returned, net sales (gross value minus returns), amount of bonus (a percentage of sales over one's quota), number of clerical errors.<sup>9</sup> All of these reflect aspects of the individual's job performance. They give some objective indication of the employee's job success.

### *What Are Good Criteria?*

To be of value, the criterion should not merely be objective, although that is desirable, but should, in addition, accurately portray the most important aspect of the job. In the study of department-store salespersons just mentioned, the most representative single measure was the net sales, largely because of its relation to other of the variables mentioned. There are, of course, numerous jobs for which no such clear-cut criterion exists, or if it does exist it is not easily obtainable. Consider, for example, a schoolteacher. What objective criteria can be obtained indicating her job performance? If one takes the number of students passing the course it may be discovered that poor teachers with low standards pass as many students as industrious teachers with higher standards. In other words, the proposed criterion in this case is an important aim of the job but fails to distinguish the good from the poor teachers. Considerable ingenuity is often required to find that particular measure which truly reveals job performance.

In any job on a piece-rate system of wages it may appear at first as if the criterion is the amount of work accomplished. In some organizations production figures continue to serve as reliable indicators of performance. However, throughout American industry there is a prevalent practice dignified by the term "stereotyped output." Numerous instances of stereotyped output have been reported from reliable sources, showing that fast workers either fail to report all their work or purposely work only part of the time. In that way the reported output of all the employees in a given department on a given kind of work is about the same. Thus,

individual differences in performance are obscured.\* For this reason production figures cannot always be used as criteria of the worker's real proficiency on the job.

Persons concerned with employment tests have consequently been forced to search diligently to find satisfactory criteria. Length of *job tenure* has been used as a criterion on the assumption that the fit survive longer than the unfit. Some indication of the *quality* of one's work is also used. In a radio-tube manufacturing plant the amount of scrappage reflected the care with which the job was performed and was consequently used as a criterion. Another form of criterion was used in a study of can packers, where production records could not be employed because teamwork was sometimes involved. Here, as in a good many similar situations, a *work sample* was used as a criterion. Thus a single worker at a time was assigned to packing cans from a conveyor into cartons. The average number of cans packed per hour based on several assignments to the "standard" conveyor provided a satisfactory work sample that served to distinguish between fast and slow workers.

### *Composite Criteria*

On some jobs it is possible to combine different measures of job performance into a single variable. The job of punch-card machine operator is one in which both speed and accuracy are important. A careful time study† of this job showed that 13.75 cards could be punched while one error was being corrected.<sup>10</sup> Therefore, it became possible to combine accuracy and speed records by the simple expedient of subtracting 13.75 cards for every error from the total number of cards punched in a given period.

The procedure involved in other attempts to combine heterogeneous criteria is often more elaborate statistically than this one. For example, the management may be interested in knowing which employees are congenial and pleasant toward customers and also energetic in keeping up "production." Such a situation might be presented to an employment manager of a taxi company. Total receipts would provide objective information on the "production" of the drivers. The number of customer complaints might serve to

\*The reasons for this practice are discussed in Chap. X.

†The definition and techniques of time studies will be discussed in the following chapter.

indicate the degree of courtesy shown by the various drivers, but it is likely that the complaints would be so infrequent as to make them useless. Accordingly, some sort of rating by supervisors or "test customers" would be necessary. That is to say, "test customers" unknown to the drivers might spend their day riding taxis and observing how cooperative, pleasant, and congenial each driver appeared. The ratings could very easily be in terms of some systematic quantitative scale.\* At the end of this survey of drivers the employment manager would have before him two sets of dissimilar data—records of receipts and ratings. How are they to be combined?

The process demands first that the average for each set of data be determined. That is, the average rating of all the drivers and the average amount of money turned in per man, are both determined. It is unlikely that the arrangement of drivers from lowest to highest in terms of ratings would correspond precisely with the arrangement of the same drivers from lowest to highest in terms of the amount of money turned in. For this reason, it becomes necessary to know something of the relative position of each driver in each of these arrangements. One way of doing this is to determine the extent to which each driver differs—deviates—from the average, both in regard to his receipts and in regard to his rating.

An individual's deviation from the average can be computed in a number of different ways. The first and simplest way is merely to find the difference between his receipts and the average receipts, or between his rating and the average rating. Such a procedure reveals indications of the individual's relative standing in each distribution, but the terms are unlike (one being ratings, the other dollars and cents) and cannot be combined.

It so happens that every distribution possesses certain statistical characteristics such as range, and central tendency or average.† One of these purely statistical characteristics is the standard deviation. Nearly all (99 per cent) of a normal distribution is confined within the range of scores represented by the average score plus or minus three standard deviation units. The number of standard deviation units in a normal distribution remains constant, regard-

\*A detailed discussion of rating scales follows this section.

†For those interested in a more detailed treatment of these statistics, see Appendix I.

less of the extent to which the scores scatter on either side of the average. Consequently, if the scores scatter widely, the units must be "stretched" to include in each a great number of different score values. On the other hand, if the scores show little scatter, then the standard deviation must "constrict" and will include only a small number of score values. The standard deviation, therefore, is defined as a measure of scatter or spread. We shall not be concerned here with the problem of how a standard deviation is computed. It is enough to remember that for any normal distribution it is a constant value which, when multiplied by six (three on either side of the average), will indicate approximately the total range of scores.

Returning, then, to the hypothetical problem, the situation may be presented graphically in the following figures. These are ideal-

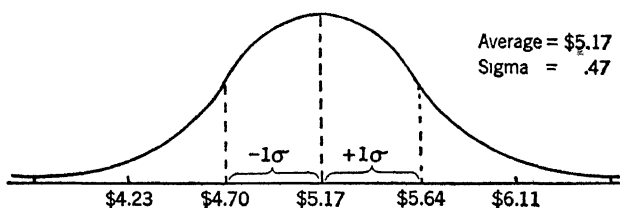


Figure 8. Showing Hypothetical Distribution of Taxi Receipts.

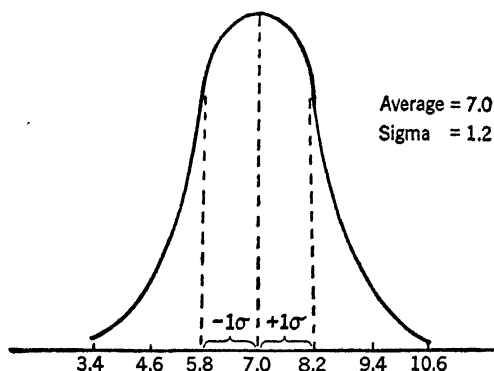


Figure 9. Showing Hypothetical Distribution of Taxi Driver Ratings.

ized distributions for the sake of explanation. However, it is important to note that the standard deviations, indicated by



the Greek letter  $\sigma$  (sigma), differ from one distribution to the other not only in their numerical size but also in the fact that one is in terms of cents and the other in terms of rating grades. At the same time, there is an element of sameness between the two sigma from the different distributions, since a man who turns in 47 cents more than the average and is rated 12 points above average is in the same relative position in each distribution.

If a given driver has a rating of nine and turns in \$4.50, his relative standing in each distribution can be found by computing his "sigma score." His sigma score for ratings would be found by computing first his deviation from the average and dividing the result by the sigma of the distribution. (Average is 7, therefore the deviation is +2 which is +1.67 sigma from the average.) In a similar manner, \$4.50 deviates from the average by .67 which is only -1.43 sigma from the average. Having reduced, then, the assigned rating score and the receipts to a common term, these sigma scores can be averaged to obtain a single variable which represents two criteria. In the case just elaborated, the combined variable would be the average of -1.43 and +1.67 or +.12.

The combined criterion variable is often superior to a single variable because it is affected by at least two factors reflecting job performance. Undue weight is, therefore, not so likely to be given to a single aspect of the job, totally excluding other, perhaps equally important, aspects.

As will be shown, the importance of deciding upon a satisfactory objective criterion whose dependability is known, cannot be over-emphasized. It is the basis not merely for deciding who are the satisfactory and unsatisfactory employees but also for the development of selection tests to be discussed presently.

### 3. RATING SCALES

As indicated in a previous section, occasions arise in searching for a criterion where no objective indication of work performance is available. Numerous examples might be cited, most of which come from service rather than production jobs. In this category are bellhops, cafeteria workers, filling-station attendants, school-teachers, and some persons in minor supervisory positions. For these workers no errors are recorded, no production figures are

available, there is no indication of number or value of sales which will reflect clearly without distortion the individual's work performance. Accordingly, rating scales are sometimes used to fill this lack when it is desirable to get some measure of the worker's adjustment and value to the concern.

### *Kinds of Rating Scales*

One of the simplest types of rating scale is the *order of merit*. In this the rater (usually a supervisor or foreman) arranges the men to be rated in order from the highest to lowest, for a single personality trait or to make an over-all evaluation of a man's work performance.

Another very simple but not very satisfactory scale is a *numerical* or *alphabetical rating*. For instance, a number of traits thought to be important in the job might be arranged as follows:

Aggressiveness	1	2	3	4	5	6	7	8	9
Leadership	1	2	3	4	5	6	7	8	9
Originality	1	2	3	4	5	6	7	8	9
Thoroughness	1	2	3	4	5	6	7	8	9

The rater merely indicates by circling one of the numbers opposite each trait the "amount" of the trait possessed by the man being rated. Some have preferred to use letters, A, B, C, D, F, which mean respectively, excellent, good, average, below average, and very poor.

The *check-list* method is also rather crude but helpful in some situations. One kind of check-list rating involves a list of opposite descriptive terms, one in each pair being underlined to describe the man being rated. A sample list follows:

Ambitious— <u>Lazy</u>	Muddled thinking—Clear thinking
Stingy—Generous	Bossy—Submissive
Retiring—Aggressive	Diplomatic—Tactless

Other check lists are not arranged in this fashion and do not require a response to every item but merely ask the rater to indicate the most outstanding characteristics of the man being rated.

The *man-to-man* rating system represents one of the earliest attempts to increase the reliability of these devices. It is obvious

that one of the chief difficulties with numerical, check-list, or even order of merit ratings, is the lack of clear definition both of the traits being rated and various levels of the traits. In the man-to-man method a given trait is identified and a number of men (usually three or five), known to the rater and who represent different levels of the trait, are listed. A portion of such a rating sheet may look something like the following:

<i>Persistence:</i>	Man being rated _____
Above average—B. J. Black_____	
Average —J. R. Green_____	
Below average—B. R. White_____	

For other traits additional men may be listed. The rater's task is to place a check beside the name of the man who is most like the man being rated in respect to the trait concerned. This procedure tends to "objectify" both the trait and the level of the trait intended by the terms preceding each of the names. The man-to-man system was used with some success in selecting salesmen prior to World War I and in rating officers in the United States Army in 1917-1918.

Probably the best rating device for most situations is a *graphic rating scale*. Such a scale has two outstanding features which readily identify it. First, each trait is carefully defined in terms of the job situation. Second, the various levels of the trait are likewise defined by descriptive phrases also related to the special job to which the man is assigned. As originally designed, the descriptive phrases of the graphic scale were arranged in a regular ascending or descending order reading from left to right. For reasons to be mentioned shortly it has seemed advisable to scramble the regular order as shown in the following scale constructed for cafeteria counter workers by the United States Employment Service.<sup>11</sup> For purposes of scoring, each of the descriptive phrases is given an arbitrary value. In the case of Appearance, as given in the scale following, the scores reading from left to right were 4, 1, 0, 3, 2. If one reads the descriptive phrases carefully, it will be apparent that the higher the numerical score on such a scale, the better is the worker.

Name of Worker \_\_\_\_\_

Date \_\_\_\_\_

Rated by \_\_\_\_\_

*Instructions to rater:* Please rate this individual on the actual work which she has been doing. Before attempting to judge this worker it is necessary to have clearly in mind the exact qualities on which she is being rated. For this information, please read the definitions very carefully. Place a check (✓) in the parentheses directly above the phrase which best describes the worker's standing on the quality.

Please write in the space provided for *Remarks* which follows each item any interpretive or additional comments with regard to that particular item.

1. *Alertness:* Is this individual quick and active and at all times attentive and ready to take care of customers?

( )	( )	( )	( )	( )
Serves customer within reasonable time	So attentive that customer's wants are anticipated	Seldom ready to serve customers	Tends to allow other workers to serve the customer first	Serves customer quickly

REMARKS:

2. *Appearance:* What is the impression created on customers by this person's appearance?

( )	( )	( )	( )	( )
Appearance is a definite asset	Careless about appearance	Appearance a handicap	Gives good impression	Fair appearance

REMARKS:

3. *Adjustment to customers:* Does this worker adapt readily to different types of customers and does she try to please the hard-to-please customers?

( )	( )	( )	( )	( )
Usually adjusts well to customers	Good social adjustment. Tries to please customers	Makes sarcastic remarks to difficult customers	Successfully handles customers—even hard-to-please	Not tactful. Talks too much with customers

REMARKS:

4. *Willingness to work:* Does this person show willingness to do as much as or more than her share of the work?

( )	( )	( )	( )	( )
Manifests eagerness to work by consistent hard work	Sluggish and slow to serve many customers	Does as much work as the average worker	Serves customers promptly	Only wants to get by. Stands around and lets others work

REMARKS:

5 *Manner*: Is this person courteous and does she have a pleasant disposition

( )	( )	( )	( )	( )
Civil and polite. Is respectful. Acts in usual conventional manner	Grouchy, over- bearing manner. Unpleasant Does not smile or is rude	Is considerate and pleasant to customers	Is impolite to the difficult cus- tomer. Irritates some customers	Forgets self and thinks only of customer's pleasure

REMARKS:

6 *Speed of movement*: Are this person's movements characterized by speed and rapidity?

( )	( )	( )	( )	( )
Speed adequate for normal work conditions	Unsatisfactory. Very slow worker	Extremely rapid worker. Can handle rush periods well	Rapid worker but cannot keep up in rush periods	Acceptable but works slowly

REMARKS:

7. *Deftness of movement*: Is this person so careful and adroit that she breaks few dishes and has few accidents?

( )	( )	( )	( )	( )
Breakage and accidents costly to organization	Very careful worker. Never breaks dishes	Movements care- ful and precise. Breakage negligible	Must be con- stantly remind- ed to use more care	Satisfactory but needs to improve

REMARKS:

8. *Physical condition*: Does this person show by her regular work that she is strong, not easily fatigued, and rarely ill?

( )	( )	( )	( )	( )
Strong, rarely ill. No evidence of fatigue even after extremely heavy day	Can do only the lightest work. Cannot stand on feet for long periods	Able to work for long periods. Output not af- fected by normal working conditions	Loses much work because of ill- ness. Easily fatigued	Can take care of her share of the work load

REMARKS:

9. *Poise*. Is this person at ease and not easily flustered when serving customers?

( )	( )	( )	( )	( )
Generally well poised	Nervous or con- fused when serv- ing difficult customers	Prone to "blow up" when deal- ing with irritable customers	Very successful in serving even most difficult customers. Al- ways sure and confident	At ease when serving the majority of customers

REMARKS:

10. *Cleanliness and neatness in work:* Does this person keep her counter, table, dishes, and equipment clean and neat?

( )	( )	( )	( )	( )
Orderliness in her work is satisfactory	Counter always neat and clean with dishes appropriately arranged and served	Counter dirty, leaves food on sides and out-sides of dishes Poor display of dishes	Must be told often about her lack of neatness	Lack of cleanliness seldom need be criticised by supervisor

REMARKS:

11. *Ability to suggest items to customers:* Does this person make tactful and appropriate suggestions in aiding customers to choose dishes?

( )	( )	( )	( )	( )
Makes skillful effective use of suggestions	Not effective in making suggestions	Fairly satisfactory in aiding customers in their choices	Knows when and how to make suggestions	Tactless use of suggestions. Irritates customers

REMARKS:

12. *Practice of economy in handling foods:* Does this individual use economy in handling foods and equipment so that there is no unnecessary waste?

( )	( )	( )	( )	( )
Very careful. Avoids waste. Portions ingredients and food correctly	Sometimes is careless in portioning materials	Uses good judgment in portioning food	Very wasteful. Carelessness causes much expense	Little unnecessary waste of materials

REMARKS:

13. *Over-all rating:* Please rate this person on her value to the organization by placing her in one of the five groups shown below

( )	( )	( )	( )	( )
Little value to organization. Belongs in lowest $\frac{1}{5}$ of group	Of more value than lowest $\frac{1}{5}$ but not as good as middle $\frac{1}{5}$	Value to organization same as middle $\frac{1}{5}$ of coworkers	Of less value than the highest $\frac{1}{5}$ but better than the middle group	Most valuable to organization. Belongs in highest $\frac{1}{5}$ of group

REMARKS:

### *Reliability of Ratings*

One of the ways in which a rating scale is itself evaluated is by computing its statistical reliability. This can be done by either of two ways. First, the same supervisor may rate employees on two different occasions, with enough time elapsing between ratings so that memory of the first rating will not influence the second. A

second method is to have two or more raters evaluate the work performance of the same group of employees. In either procedure at least two sets of ratings are available for a single group of workers. These can be quantified by assigning scores, as was done in the accompanying scale, and then correlating the two sets of data. The resulting correlation coefficient is referred to as a "coefficient of reliability."\*

The reliability of the rating scale for cafeteria workers was tested by both methods described above, using seventy-six workers and three raters. The coefficients between the raters varied from .40 to .67. However, when the first and second ratings of each of the raters were correlated the coefficients varied between .82 and .92. Apparently this rating scale gives scores that are nearly alike when a single rater evaluates a group of workers on two different occasions, but there is less agreement between raters when all are rating the same group. This finding is just what one should expect, since different supervisors see workers under differing circumstances. On the other hand, a single supervisor is not likely to change his opinion of a given worker in the lapse of time between ratings.

In spite of the statistical shortcomings of graphic rating scales, illustrated even in the case of this relatively superior scale, there is considerable agreement that the graphic method in most cases is more reliable and useful than any of the methods previously discussed.

### *Limitations of Rating Scales*

Aside from the low reliability of rating scales which we have just discussed, they are also susceptible to the "halo effect." That is to say, an exceptionally high or low rating on a given item tends to color judgments of other traits that follow. If an individual is rated rather high in honesty he is likely, regardless of the facts, to be rated rather high in the trait that follows in the rating scale. The halo effect is especially evident in graphic scales arranged so the lowest extreme of each trait line is at one end and the highest ranking phrase is at the other. An effort to minimize

\*For additional discussion of reliability, see Chap. II Psychology and Learning, page 42, or this chapter, page 175.

the halo effect is illustrated in the cafeteria-worker scale, where the rank order of the descriptive phrases is scrambled. This procedure forces the rater to read each phrase and tends to break up an all too easy inclination to be guided by one's general impression as to whether the worker falls above or below average on all traits.

The validity of ratings is dependent upon the length of acquaintance. Generally speaking, there is a tendency to "over-rate" those known longest and perhaps underrate those known only a short while. A study of one thousand public-school teachers rated by their supervisors showed that only 10 per cent of those known less than a year were rated "excellent." On the other hand, of those known one to seven years, 47 per cent were rated "excellent." This difference in ratings was not wholly due to any real increase in teaching ability with added experience, since ratings of "physical efficiency" in the same groups showed the same trend.<sup>12</sup> The only explanation for both sets of data is that supervisors tend to be less critical of subordinates as their period of acquaintance continues. It is quite possible that in certain isolated cases the opposite inclination might reveal itself. No studies have come to light indicating that "familiarity breeds contempt" but the very existence of that popular notion argues in favor of some such tendency. The evidence at hand suggests that leniency in general increases with length of acquaintance, although there may be exceptions to the rule.

Ordinarily, a rating by a single rater is less valid than the combined ratings of several judges, provided all judges are acquainted with the persons so rated. Where considerable importance is attached to the ratings, at least three raters for each subordinate are recommended. Moreover, even with several raters the validity of the rating may be less than desirable unless special efforts are made to train the raters to: (a) consider only job behavior; (b) rate subordinates in reference to the present group of employees; (c) take sufficient time to give as accurate estimates as possible.

### *Summary of Rating Scale Principles*

The following twelve principles, proposed some years ago as guides to the construction and use of rating scales in industry,<sup>13</sup> aptly summarize the subject.



1. Records concerning supervisors' estimates of subordinates should be accumulated and filed in advance of any emergency requiring such estimates as a basis of decision.
2. Estimates should be based on qualities that are defined unambiguously in advance.
3. Qualities to be rated should be defined in objective terms so far as possible and should be grouped according to the accuracy with which they can be judged.
4. Each quality to be rated should refer to one type of activity carried on or to one type of result achieved by those to be rated.
5. Ratings should be confined to past or present accomplishments.
6. The list of qualities to be rated must be related directly to the type of work performed by those to be rated.
7. The method of recording one's ratings should be easily understood and easily complied with.
8. Estimates should be expressed in a uniform manner by all raters.
9. A statistical method of correcting for the tendency to rate "too high" or "too low" should be employed.
10. Ratings should be accepted and filed for use only from those who have proved themselves capable of accurately judging human qualities.
11. Each executive should rate his subordinates on the first quality, then, rearranging the order at random, he should rate them on the second quality, and so on, for the remaining qualities.
12. As many judges as possible should be employed in rating a given person and an average of all the available ratings should be used as the index for that person.

Two additional principles might be added to this list. First, if ratings are to be used, the graphic form is probably the best. Second, ratings should only be used when more objective indicators of job performance are lacking.

## 6. EMPLOYMENT TESTS

Perhaps the most widely publicized contribution of psychology to employment problems is the development of special principles and procedures for selection tests. Although psychologists have had a large part in developing rating scales, more objective and satisfactory job criteria, and better interviewing techniques, their major industrial efforts have been expended in the development of tests.

### *Kinds of Tests*

With respect to the features measured, it is convenient to divide tests into five groups. First are the general intelligence tests which are familiar to most college students. Second are the general per-

sonality tests designed to measure the "dimensions" of temperament. Chief examples in this area are tests of ascendance-submission, introversion-extroversion, emotional stability and neurotic tendencies. Next are the tests of aptitudes. These are constructed to measure the potentialities of an individual in a fairly restricted area, such as musical aptitude, mechanical aptitude, and clerical aptitude. Fourth are the special trade tests which are distinguished from aptitude tests (*a*) in being more specifically related to a given job, and (*b*) in being measures of present skill or knowledge rather than tests of potentialities. Trade tests are available for streetcar motormen, lathe operators, taxicab drivers, electricians, carpenters, chefs, nurses, cashiers, policemen, and a great many other special occupations. Finally, there are the tests of special abilities, such as finger dexterity, reaction time, form perception, judgment of distance, eye-hand coordination, sorting speed, steadiness, accuracy of aiming, and a host of others.

Tests may be classified in respects other than the functions measured. Tests may be divided into those that can be administered to a group, and those that must be given to only one individual at a time. Moreover, there are paper-and-pencil or verbal-response tests and "performance" tests. The latter include all those that demand the testee to manipulate forms, assemble parts of an object, execute skilled movements, or demonstrate competency in a "work sample." Practically all tests, with the exception of many designed to measure general personality traits, can be divided into speed vs. power tests. As the terms indicate, power tests have no time limit, but the items are of increasing difficulty, while speed tests impose a time limit.

For any particular selection problem an employment manager may decide to use not just one test but rather a battery of tests which may include only one or all of the kinds indicated. Before, however, discussing the question of what tests are applicable in particular situations, it will be well to review and amplify the statistical terms already mentioned in Chap. II.\*

### *Reliability*

The reliability of a test is the degree to which it remains con-

sistent on repeated applications to the same group of individuals. Care must be taken to avoid during the lapse between testing any opportunity for improvement in the function being tested. Moreover, testing conditions must remain constant. In employment tests, as in measures of school attainment, the usual way of expressing reliability is in terms of a correlation coefficient. In practice the reliability of a test is usually determined by taking either the scores of the first half and correlating them with scores of the second half, or by correlating the total of the odd items against the total for the even items. The reason for this procedure is a very practical one. It is frequently difficult to retest the same individuals under the conditions mentioned at the beginning of this paragraph. For tests to be dependable within the limits ordinarily tolerated in business and industry, they should have reliability coefficients in the neighborhood of .90 or better.

### *Validity*

The validity of a test is the extent to which it measures what it is reputed to measure. In the case of employment tests validity, like reliability, is expressed by a correlation coefficient. But the variables correlated for validity purposes are not the variables correlated for reliability. In the case of validity the test score is correlated with some measure of job performance—the criterion. Certainly, if the aim of employment procedures is to discover the most satisfactory employees, the tests should distinguish between the satisfactory and unsatisfactory applicants. The correlation of test performance with job performance is consequently the measure of the test's validity. Validity coefficients are always less than reliability coefficients. A test may be highly reliable and low in validity, but can never be more valid than reliable. That is to say, a test is unlikely to correlate with the criterion more closely than it correlates with itself.

An example of the manner in which validity coefficients differ with representative tests and some occupational groups is given by the following table.<sup>14</sup> Inspection of the table reveals that the pursuit items of the mechanical aptitude test are more valid for power sewing-machine operators than any of the other tests included here. The same items, however, have nearly a zero

Table 3. Showing Correlations between Tests and Work Performance

	<i>Tests<sup>a</sup></i>			
	I	II	III	IV
Calculator (key-actuated) operator	.414	.602	.535	
Card-punch-machine operator	.513	.537	.547	.098
Power sewing-machine operator		.283	.501	.510
Can packer		.205	.202	.089

<sup>a</sup>Tests indicated by numerals are:

- I. Letter-digit substitution
- II. Name-comparison items from Minnesota Test for Clerical Workers
- III. Number-comparison items from Minnesota Test for Clerical Workers
- IV. Pursuit items from MacQuarrie Test for Mechanical Ability

validity for card-punch-machine operators. On the other hand, the name-comparison items from the clerical test have a higher validity for calculator operators than power sewing-machine operators.

For purposes of predicting the precise level of work performance of an individual from a knowledge of test scores alone, the test must have a validity coefficient above any given in the preceding table. A test with a validity coefficient below .50 is virtually useless as a device for individual prediction. However as the coefficient increases beyond .50 the margin of error decreases sharply.

When one remembers that the best tests so far devised rarely exceed .75 in validity, the reader may well question the value of most selection tests. However, the situation is not quite so hopeless as it may seem, since the employment manager is rarely called upon to predict exactly what a specific applicant will do on the job. The employment manager's function in selection has largely been fulfilled if he can, with tolerable accuracy, divide his applicants into three groups: those who will unquestionably meet the minimum requirements of the job, those who are doubtful, and those who should be rejected. Such a task is much less exacting than predicting the precise value of the sales or the number of units produced by a given worker. Like the insurance actuary who predicts the mortality rate of people at a given age, the employment specialist predicts the percentage of job failures in a group of applicants all obtaining the same test score.

The establishment of critical scores instead of the use of the correlation methods often assists in arriving at an indication of the validity of tests under study for employment purposes. A critical score is merely that level of test performance which may be used as a dividing line between those who are rejected and those who are accepted for employment. It is established at a level such that the largest number of unsatisfactory and the smallest number of satisfactory candidates are rejected, within the limits of the demands for, and the supply of labor. The problem of establishing

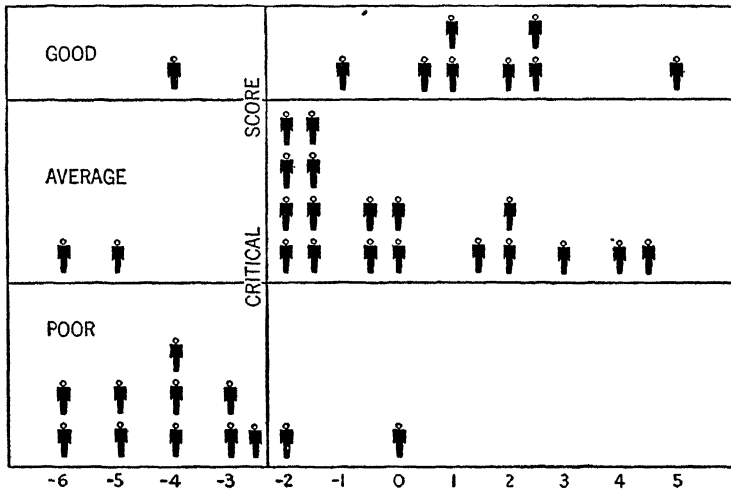


Figure 10. Showing Graphic Determination of a Critical Score Based on Estimates of Agricultural Engineers by Their Instructor.<sup>15</sup>

a critical score is well illustrated in Fig. 10 above. The critical score of  $-2.0$  meant that 83 per cent of the poor group and only 10 per cent of the average and good groups fell below that point. If the test used in this situation had given a distribution of scores such that the poor group could not be easily separated from the rest, the test would have lacked validity.\*

In other words, the attempt to establish a critical score often reveals the essential dependability of a test more clearly than does a validity coefficient.† The reason for this state of affairs rests in

\*In this example the number of cases is so small that a repeat study of the same or a comparable group might show important shifts in the position of men relative to the critical score.

†For data such as that given in the above example, a technique has been devised for determining the point of maximum differentiation.<sup>16</sup>

the definition of validity, namely the degree to which a test accomplishes the task for which it is designed. The usual correlation technique indicates the relation between two variables throughout their respective ranges. Usually the employment manager is not especially interested in tests which will differentiate between those who are poor and very poor at one extreme, nor between those who are good and very good at the other extreme. A low validity coefficient does not necessarily mean that the test will not do the much simpler task of distinguishing between merely the good and poor applicants. Of course no one would argue that the present tests which do a fair job of distinguishing between good and poor applicants are wholly satisfactory. Efforts are constantly being made to increase their validity as measured by correlation methods.

In addition to these considerations it has been pointed out that even tests with relatively low validity coefficients may prove valuable if only a small percentage of the applicants are accepted for employment. That is to say, if one uses a test with a validity of only .35 in a job situation where it is possible to hire only those standing above the median score (the upper 50 per cent), the average employee thus selected will necessarily be superior in job performance to the average of the total group of applicants. The percentage of satisfactory employees among those hired steadily increases as the critical score is pushed higher and higher, or as the percentage of applicants hired is progressively decreased. The statistical conditions giving rise to this relationship are too complicated to be introduced at this point.<sup>17</sup> The following figure, however, demonstrates that tests with low validity still have some value, particularly when only a small percentage of the applicants are taken.

### *Which Test to Use?*

Faced with the practical situation of deciding which test to use for selecting applicants for a given job, how does the employment manager proceed? This question has been answered in part by the preceding discussion of validity. In other words, he selects those tests which have a high reliability and a high validity. Simple as that answer may seem, it involves an enormous amount of pains-

taking work. In this connection, a number of practical guides are pertinent.

First, in making a selection of employment tests one cannot rely upon their names to indicate their suitability in a given organization. A test labeled "Clerical Ability," may, when given

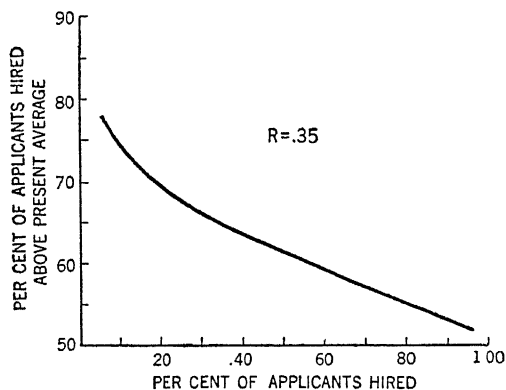


Figure 11. Variation in Per Cent of Employees Who Will Be Above the Present Average of Employees When Different Percentages of Applicants Are Hired Using a Test with a Validity Coefficient of .35.<sup>18</sup>

a trial, prove less valid than a section of some mechanical aptitude test for employing bookkeepers. One study showed that a portion of a clerical test was more valid for selecting department-store wrappers than were certain tests of manual dexterity.<sup>19</sup>

Second, the initial group of tests used should include a larger number than is desired in the final battery. It should be clear from the foregoing discussion that the process of developing a suitable battery is often a matter of "cut and try." In preliminary trials it has been found advisable to use two, three, or four times the number of items desired in the completed battery. It is then possible to eliminate progressively those items which fail to distinguish between the good and poor employees as measured by the criterion.

Third, tests which correlate highly with the criterion should be correlated with each other to discover whether they are testing the same or different functions. If two tests are highly correlated with each other they may be presumed to measure much the same functions. On the other hand, if their intercorrelation is low, they are measuring dissimilar functions. Our concern for economy of

time and effort makes it desirable to eliminate any unnecessary duplication that is present in the situation where tests have high intercorrelations. Moreover, it is possible to compute the combined validity of two or more tests by means of "multiple correlation" when the intercorrelations as well as the validity coefficients are known. The statistics of the situation are such that if two tests have validities of .6 and .5 with an intercorrelation of .00, their combined validity is .78; while two tests with the same validity coefficients but an intercorrelation of .80 have a combined validity of only .6.

A practical demonstration of these relationships is shown in the following table:<sup>20</sup>

Table 4. Correlations between Several Dexterity Tests and Earnings of Menders in a Hosiery Mill

(Effect of age and experience statistically eliminated.)

	<i>Correlation with Earning</i>
Purdue Hand-precision test	.27
Finger dexterity (error score)	.18
Hayes Pegboard	.16
Composite score of above tests	.35

Fourth, once a battery of tests is adopted for use, it must be subjected to regular periodic rechecking and revision in view of changing labor conditions and changing aspects of the work.

Finally, it has been suggested that tests can be selected after a job analysis aimed at discovering exactly which psychological functions are used and to what extent they are involved. A test battery is then selected to measure each of these functions, the scores being weighted according to their importance as revealed by the job analysis.

### *Intelligence Tests*

It is not within the province of this chapter to discuss each kind of test separately. However, the problems and information with regard to intelligence and personality tests are sufficiently unique to warrant some special mention. It is interesting to recall that applied psychology made its first halting movements when, in the early years of this century, Alfred Binet introduced his tests of



general intelligence into the school system of Paris. Furthermore, applied psychology experienced its first growing pains when the United States Army adopted in World War I as a part of its selection procedure the Alpha and Beta tests for general intelligence. The early history of applied psychology to a very large extent centered around the problems of intelligence and how it affects behavior.

One of the important findings which came out of the vast experience accumulated in the First World War was the occupational hierarchy of intelligence which is described more fully on page 485. This hierarchy in general showed what everyone had long suspected but no one had ever demonstrated, namely that the mean intelligence of the professions as a group is higher than the mean intelligence of the technicians; the technicians are intellectually superior to the skilled workers who in turn are superior to the semiskilled, and so on down the line. However, there is considerable overlapping in the groups so that it is not possible in the vast majority of cases to look at a man's intelligence-test score and determine in what occupational class he falls.

So far as the employment psychologist is concerned the level of intelligence demanded by each of the jobs within his organization can be gauged roughly from this hierarchy. Oftentimes it is possible to discover through the job analysis the minimum intelligence required for each job. Once these have been established, it is possible to select a satisfactory test from a rather large collection, most of which have been adequately standardized. It is not surprising in view of the rather long history of research on this kind of testing that one should find adequate instruments almost at his immediate disposal. Nevertheless, it is necessary to check the validity of these tests against the job criteria if one is to be certain of their selective value and to make positive that the job requirements have been correctly interpreted in terms of test performance.

### *Personality Tests*

Until fairly recently most of the emphasis in employment testing has been on the measurement of aptitude, skills, and general intelligence as just described. The progress along this line has been generally satisfactory as indicated by two kinds of evidence. First, a

great many employment specialists attached to concerns like Scovill Manufacturing Company, The Pennsylvania Company, Philadelphia Electric, Procter and Gamble, Eastman Kodak, branches of the General Electric Company and many others testify in the same vein as E. D. Bartlett of the Atlantic Refining Company who reported that the employment testing program saved his company thousands of dollars each year, more than repaying for the time and money spent upon it.<sup>21</sup> Second, a number of control studies have demonstrated that where adequately standardized and administered skill and aptitude tests are used for employment purposes, relatively few discharges are traceable to deficient job skills. One firm employing, with the help of tests, a large number of clerical, technical, and mechanical workers examined the records of four hundred consecutive discharges to find that only 8 per cent were due to failure in skills. Presumably the remaining 92 per cent were asked to leave because their personalities conflicted either with the job requirements or with other personalities in their work group.<sup>22</sup> A study such as this one points to the necessity for a more rounded testing program to include the measurement of personality factors.

Psychologists and employment specialists have not been unmindful of the desirability of considering personality features in employment. On the other hand, they have recognized the problem but have been faced with a number of difficulties in constructing satisfactory instruments for this purpose. In the first place, there is yet no clear definition of the features to be included within the personality concept. The descriptive terms are not precise. For example, we have a number of introvert-ambivert-extrovert tests; apart from these are tests of ascendancy-submission. There is reason to suspect that even though these tests use items that are in many places quite different, they may measure in part the same basic, unnamed features. Second, personality however defined, is something variable within broader limits than ordinarily thought to apply to intelligence or skills or aptitudes. That is to say, an individual may be gay, affable, and quite ready for a sociable party on one occasion but at other times may be reticent and grouchy. Or, he may be honest in one situation and dishonest in another. Even though after considerable clinical searching a person is found to have a

persisting "personality core," the concept of personality includes this notion of variability in action and attitude. This brings back the question of reliability. If the thing to be measured is itself variable, how can the reliability of the measuring instrument be determined? Although some investigators have attempted to deal with this problem, the answers are admittedly not wholly satisfactory.

The third great difficulty in devising personality tests comes from the fact that there are no right or wrong answers. Moreover, it is exceedingly difficult, although not impossible, to devise personality test items so that the desired answer is not obvious. One of the best disguised of the recent personality scales is the Humm-Wadsworth, used by a number of concerns as an employment aid. Yet when this scale was submitted twice to a group of students, first with instructions to be as frank as possible and second, to assume that they were in an employment office seeking a job, the scores bore little relation to each other. The students were able by assuming an attitude of "applying for a job" to change their test scores to show more of the normal and fewer of the undesirable traits.<sup>23</sup> However, the extremely maladjusted person would probably be detected by such an instrument even when in the job-seeking attitude.

In spite of these difficulties a number of personality tests are used as aids in selection. The Humm-Wadsworth Temperament Scale mentioned above consists of 318 questions each to be answered "Yes" or "No." Among the questions used are the following:

- Do you prefer bright or conservative colors?
- Do you like to go on blind dates?
- Do you like to pass along a good story?
- Do most of the people you meet interest you?
- Do you try to settle quarrels between people?
- Do you find it hard to make decisions?
- Do you like to see the villain punished?

This scale has been extensively used in some manufacturing plants that expanded rapidly during the war in which it was necessary to employ great numbers of workers in a very short time. The factors which this instrument measures are: the normal, or inhibitory "brake," which if strong enough can counterbalance otherwise unfavorable indications, but which if too strong may in-

hibit even behavior that is usually acceptable; the hysteroid, which is an antisocial tendency and is supposedly found in those who commit crimes for personal gain; the manic or excitable trend; its opposite, the depressive, which is associated with suicidal tendencies and is often found in people who fluctuate from elation to depression; the autistic, or inclination to withdraw within oneself; the paranoid, associated with a persecution complex or a tendency toward fixed ideas; and the epileptoid, which takes its name from epilepsy and supposedly shows itself in close attention to fine detail, and a distorted view of the relation of oneself to one's job and to other people.<sup>24</sup>

The Bernreuter Personality Inventory is somewhat older than the Humm-Wadsworth Scale and has probably been used in a greater variety of situations. Consisting of 125 items it permits the respondent three possible answers, "Yes," "No," and "Doubtful." All items are scored according to four sets of values giving indications of the individual's neurotic tendencies, self-sufficiency, introversion, and dominance. Certain sections of this scale have proved reasonably satisfactory as an aid in selecting salespeople who show up on the scale as being more dominant than the average of an unselected population. In one study sixty-two of the items were selected for their ability to distinguish between good and poor salespersons. When additional salespersons were examined with these items the correlation between the score obtained and the selling ability was .60 for men and .36 for women.<sup>25</sup> Particular items have also proved helpful in selecting hospital attendants.

A recent summary of the studies relating to the use of the Bernreuter Scales in distinguishing between occupational groups provides the basis for the following table<sup>26</sup>. In this, an attempt has been made to list the occupations under the features that seem to characterize them as revealed by actual surveys. It must be remembered that each pair of headings in the table represents the extremes of a distribution. Listing any occupation under any heading merely indicates that the occupational average leans toward that extreme. The bulk of the evidence seems to lead to the conclusion that the Bernreuter may show occupational trends in personality, but there are greater differences within a given occupation than between dissimilar occupations.

Table 5. Showing Occupational Trends in Personality

<i>Dominant</i>	<i>Submissive</i>	<i>Stable</i>	<i>Neurotic</i>
Policemen	Engineers	Policemen	Engineers
Salespersons	Semiskilled	Salespersons	Nurses
Accountants	Nurses	Accountants	Mechanics
"Professional men"		Carpenters	
Executives			
Y.M.C.A. secretaries			
<i>Introvert</i>	<i>Extrovert</i>	<i>Self-sufficient</i>	<i>Dependent</i>
Artists	Policemen	Accountants	Mechanics
	Y.M.C.A. secretaries	Salespersons	Carpenters
		Y.M.C.A. secretaries	Nurses

In view of this experience with the Bernreuter Inventory, an experience which is somewhat duplicated with other similar instruments, some investigators have suggested that the usual classification names applicable to personality be discarded so far as the employment psychologist is concerned. According to this notion, the employment specialists would not be interested so much in measuring a man's dominance, extroversion, or self-sufficiency. Instead, the emphasis would be placed on discovering whether or not the applicant has the "engineering personality," the "sales personality," the "clerking personality." In arriving at a description of these personalities, one would follow exactly the same procedure as is used in devising skill and aptitude tests; namely, survey the best and poorest of the present employees with a large collection of personality items in an effort to find those items which distinguish between the two extreme groups. These items may then be used on a new group of employees as a validation check. At present, no such personality tests are available.

#### 4. INTERVIEWING

The basic procedure in the process of employing workers has been, and probably will continue to be, the interview. Except in unusual circumstances it is almost indispensable. In the first place, it enables the employment manager to gain information about the applicant that he can obtain in no other more economical way. On the other hand, it also provides an opportunity for the applicant to learn about the details of the job for which he is applying. Furthermore, it provides an opportunity for the interviewer to

build good will toward his concern even if the applicant is finally rejected. For these reasons the interview is a justified part of the total employment procedure.

The more recent developments in employment psychology have, however, tended to relegate the interview to a less important role than it formerly held. Part of the reason for the shift in emphasis can be found in numerous studies showing the unreliability of judgments of vocational fitness based solely upon interviews with applicants. In one of the most widely quoted of these studies twelve sales managers ranked fifty-seven applicants in order of their estimated selling ability. Each sales manager was free to adopt whatever interviewing techniques he felt were useful to him in making a judgment as to the "suitability of the applicant for the position in question." The accompanying figure, representing only some of the applicants, indicates the wide disagreement among the managers, all of whom were experienced in making such judgments. It can be seen for example, that applicant C was ranked 1 by one manager and 57 by another. Such repeated demonstration of wide differences in estimates has led to numerous refinements in interviewing techniques.

### *Why Interviews Are Unreliable*

The reasons for the observed unreliability of the usual interview in gaining a clear picture of the applicant's ability and personality are not hard to unearth. Most interviewers with long experience but inadequate training in psychology soon develop a special "system." They are guided in their appraisals by a special set of cues which are often so vague as to defy description. Many such interviewers frankly admit they work on "hunches." Sometimes an interviewer will have a few key questions which he feels are an aid in revealing an applicant's personality. An executive may gauge ability for certain positions by observing the applicant's table manners at lunch. One sales manager had a particularly unique arrangement to "test" the applicant's suitability for the job. His office was arranged so there was no place for visitors to either sit or hang their hats. As an applicant stepped into the office the manager would glance up and remark in an offhand manner, "Hang up your hat and sit down." Then he would continue work-

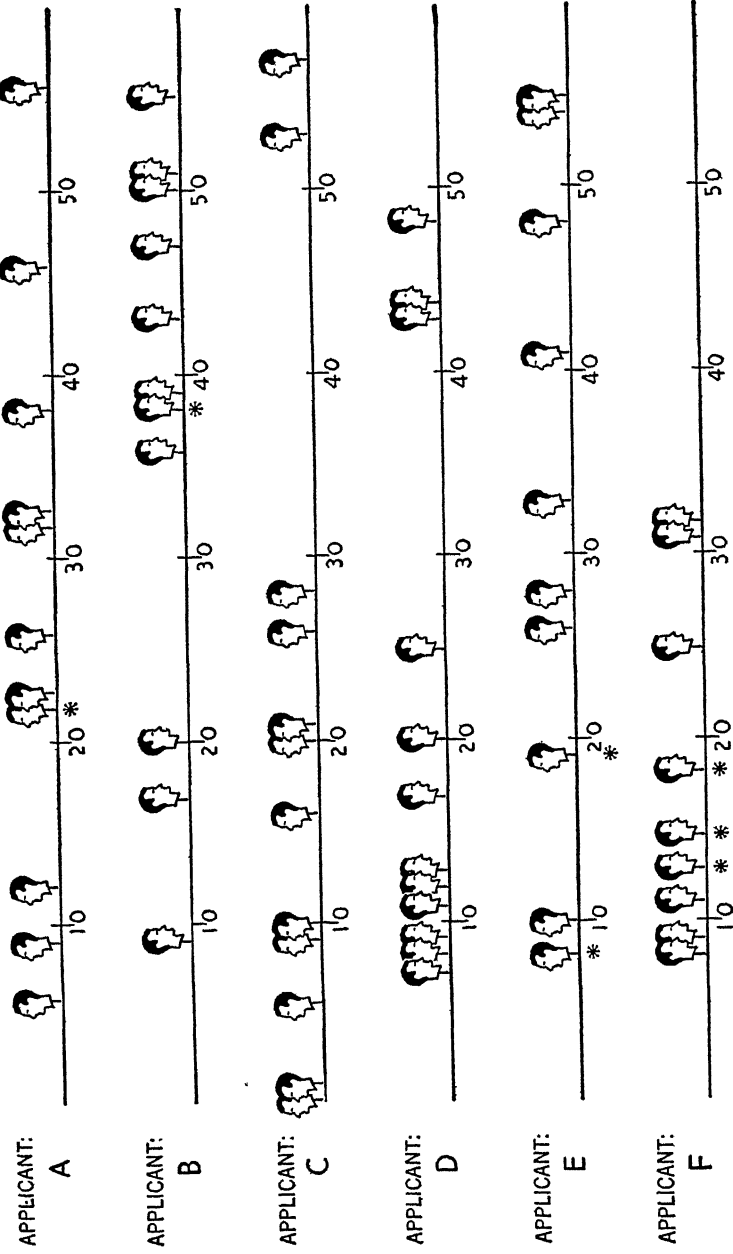


Figure 12. Showing How 12 Sales Managers Rated 6 Applicants for a Sales Position. The \* Indicates Two Managers Agreed at That Point. Adapted from H. L. Hollingworth, *Judging Human Character*, D. Appleton-Century Co., 1922.

ing for a few minutes without paying any apparent attention to the applicant. If the man simply waited in an embarrassed manner until the manager again noticed him, he was rejected. On the other hand, if after sizing up the situation he made some half-joking remark about the missing chair and hat rack, the manager assumed the applicant had the necessary initiative for the job. It is apparent in cases of this sort that the interviewer is making the error of assuming that a small sample of the individual's behavior is representative of his whole personality. It is the error of over-generalization.

At the beginning of this chapter passing reference was made to some of the unreliable systems of "character analysis" that flourish not only among the general population but also among personnel and employment managers. A belief that a man's character is revealed in his face, in the size or shape of his head, in his manner of walking or writing, is quite unfounded in systematic studies. Oftentimes such beliefs grow out of unusually dramatic experiences. An employment manager may have hired an individual with "shifty eyes" who turned out to be an embezzler. Thereafter he rejects all applicants with shifty eyes, concluding that they are all dishonest. Actually, of course, many people with shifty eyes merely suffer from a purely physiological disorder known as "nystagmus." Individual prejudices built up in this manner are another source of unreliability in interviews.

A third feature detracting from the interviewer's accuracy in judging job fitness is the variable attitude taken by applicants. Some are self-possessed and quite at ease, while others are tense, nervous, and so excited that they obscure the desirable traits which they really possess. The man who is at ease may be such simply because he has no great interest in securing the job and might consequently make a poorer employee than the nervous, ill-at-ease applicant. The varying adjustment of the applicant to the interview situation is a feature ordinarily beyond the control of the interviewer, complicating estimates of fitness.

### *Methods of Improving Interviews*

One of the simplest ways of improving the interview technique is to provide a skeleton outline of the points to be covered. Often



this outline is developed from a lengthy analysis of the job in order to discover what characteristics are needed for an applicant to fit into his place in the organization. For example, men interviewing prospective salesmen for the Tremco Manufacturing Company, a concern turning out construction and maintenance materials such as supplies for caulking, pointing, waterproofing, painting, and flooring, are provided with a list of ten characteristics to be rated. These ten items were selected from the pooled considerations of executives and a careful analysis of successful and unsuccessful salesmen in the organization.

1. Capacity for day-to-day plugging
2. Money-mindedness, order consciousness
3. Capacity for social and emotional adjustment
4. Capacity for intelligent planning of his work
5. Practical maintenance sense
6. Singleness of purpose in life, well-channeled motivation
7. Financial position—need, but no financial tangles
8. Physical energy and vitality
9. Articulation—ability to think clearly and express his ideas simply and convincingly
10. Honesty, reliability (to be judged from a commercial credit report not from the interview)<sup>27</sup>

Each of these headings has been broken down into a series of quite specific questions which can be introduced into what appears to be the casual conversation of the interview. For instance, the first item is divided as follows:

On previous jobs did he work regular hours; make 8-10 calls a day; dig up his own prospects; work on his own without much supervision?

Does he have courage to "stick it out?" Has he changed jobs frequently? Has he completed what he set out to do? Does the darker side of our proposition make him hesitate?

In the interview, was he businesslike, direct, aggressive, decisive? Was he prompt? Did he have other things planned for the day?

As a boy, was he trained in regular work habits; given jobs and held responsible for them; required to earn his own money? Was home discipline firm, regular, dependable, but fair? Did he shift for himself; get his own jobs?

In other words, the improvement which has just been exemplified from the Tremco report is an attempt to standardize the interview procedure and at the same time employ a form of rating

scale. It is important to remember that the items covered are not haphazard guesses as to what is essential and neither are they necessarily applicable to other selling positions. A somewhat more rigid system was developed by Hovland and Wonderlic who used questions dealing with the applicant's work, family, social and personal histories. Based on the answers to these questions, the interviewer then rated the applicants for positions with the Household Finance Corporation. The ratings are scored quite rigidly, according to a prearranged system. The following figure,

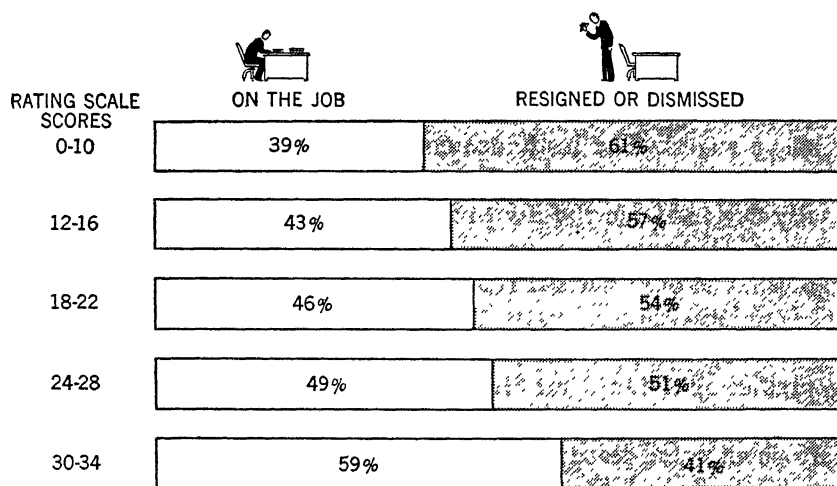


Figure 13. Showing Relation Between Ratings After a Standardized Interview and Subsequent Job Success. Adapted from G. I. Hovland and E. F. Wonderlic, "Prediction of Industrial Success from a Standardized Interview," *Jr. Appl. Psychol.*, 1939, 23, 537.

based on three hundred cases, shows the percentages on the job and those dismissed or resigned according to the scores obtained on the interview ratings. Quite obviously, the men receiving high scores were more likely to remain on the job and were presumably better employees.

Another way by which the interview can be improved is by training interviewers. Bingham and Moore<sup>28</sup> have called attention to the fact that interviewing is a skill which must be developed by attention to the various incidental, but important, features of the procedure. There is, for example, the necessity for establish-

ing a degree of confidence at the outset. The interviewer ought to give the appearance of being unhurried and sincerely interested in the applicant. The United States Civil Service Commission has noted an increase in the reliability of estimates following a period of training for their interviewers <sup>29</sup> Any training that directs attention to important characteristics of applicants and goes a step further to point out the common errors of interviewers should increase their dependability.

## 5. APPLICATION BLANK

The application blank has in the past served as a kind of adjunct to the interview, making it possible to get a quick picture of the applicant's qualifications and at the same time serving as a permanent record. The insurance companies seem to have been the first to investigate the selection possibilities in the gross statistics easily derived from the information contained on the usual form. In view of the constant use of actuarial tables in insurance companies, it is only natural that they should turn attention to the relation between age, marital status, and so on, to survival on the job. At any rate, some companies have been unusually successful in predicting the success of their life-insurance agents by "scoring" the application blank according to a system based on the known performance and features of good and poor agents. The technique has been applied in concerns other than insurance companies, although for the most part only applicants for sales positions have yet been studied in this way.

As an example of the manner in which the scores are assigned to an application blank, let it be assumed that there is some satisfactory criterion of selling in the *organization under consideration*.\* It may be supposed, further, that 70 per cent of the salesmen less than forty years of age have criterion scores that are above average (above the median criterion score for the group), and that 20 per cent of the salesmen forty to forty-four years of age also have higher than average criterion scores. Under such circumstances applicants less than forty receive a score of 7, while those forty to

\*There is a growing conviction that selling ability is not as "general" as was once believed. A scoring system that accurately predicts performance in one organization will not necessarily prove accurate in another concern.

forty-four receive a score of 2. In this way the scores to be assigned in each of the following items were worked out for the Tremco Company, already mentioned. (See Table 6.)

The total scores on these thirteen items, obtained for nearly fifty salesmen already employed, correlated .67 with the criterion, a relationship that is rather high. After the critical score\* of 62 was established in this case, sixty-five men were employed, but thirty-two, or approximately half, failed on the job within two years. If applicants had been rejected on the basis of the critical score alone, twenty-seven of those that were hired but failed would not have been hired at all. Moreover, thirteen others would have been rejected who were still on the job, but of these, eight were regarded as poor salesmen. If the thirty-two who left the work are combined with the eight potential failures, there are forty actual or potential failures. The use of the critical score would have prevented the hiring of all but five of these failures and would also have eliminated five satisfactory men. In other words, the use of the critical score would have resulted in fewer men being hired but the percentage of failures would have been reduced from 61.5 to 25.

The application of a similar scoring system for the application blank has been of considerable benefit to several life-insurance companies. One such concern had 813 agents as of January, 1935. A year later, after the introduction of the scoring technique, the sales force was reduced to 559. However, the average "production" per agent in 1936 showed an increase of 54 per cent over the 1935 average, while the company as a whole realized an increase of 7.5 per cent.<sup>30</sup>

By way of summary, it must be emphasized that a scoring system for the application blank is based on a statistical analysis of the features of good and poor men already employed. After this preliminary analysis has been made the system may then be applied tentatively to new applicants, who are followed up to see whether a rigid policy of acceptance or rejection on the basis of the obtained scores would have eliminated a large proportion of the poor men

\*A critical score is one established as the "passing grade." Applicants with scores higher than the critical score are deemed acceptable; those below are not acceptable. The critical score was established, but not employed at the outset because of its experimental nature in the Tremco Company.

Table 6. Scoring Weights for Personal History Items

	Score		Score
1. Age		9. Years on last job	
50	4	Less than 1	5
45-49	5	1 to 1 yr. 11 mo.	1
40-44	2	2 to 2 yr. 11 mo.	3
up-39	7	3 to 3 yr. 11 mo.	6
		4-5 yr. 11 mo.	8
2. Height		6-9 yr. 11 mo.	10
72 in.-up	7	10 or more	5
70 in.-71.9	5		
69 in.-69.9	4	10. Experience in maintenance	
up-68.9	3	None	3
		Any amount	6
3. Marital status			
Married	5	11. Average number of years	
All others	3	on all previous jobs	
		1-2½	3
4. Number of dependents		3-6	5
4 or more	0	6½-10	8
3	3		
2	6	12. Average monthly earnings	
1	7	on last regular job	
None	3	Up to 150	5
		150-199	4
5. Thousands of Insurance		200-249	8
10 or more	5	250-349	1
5 to 10	6	350-399	5
1 to 5	3	400-up	6
None	6		
		13. Reason for leaving last	
6. Amount of debts		regular job	
None	4	Still employed	10
Current	6	Job discontinued	7
\$500 or more	5	(Depression)	
		(Company suspended)	
7. Years of education		(Also illness and circum-	
Grades 1-8	6	stances beyond man's control)	
9, 10, 11	3	To better self	5
12, Col. 1	6	(Positive reasons)	
Col. 2, 3	0	Was dismissed	4
Col. 4, more	5	(But if because of conflict	
		with management, score as	
8. Number of clubs		negative reason)	
None	6	Negative reasons	2
One	4	(Friction)	
Two	6		
Three, more	3		

CRITICAL SCORE = 62

The experience of the company is that 70 per cent of those scoring above 62 are still working, while only 30 per cent of those scoring below 62 are still employed.

and a small proportion of the good employees. If such is the case, presumably the system is satisfactory and is ready for adoption.

## 7. SUMMARY

The discussion of employment procedures in modern industry has emphasized the techniques of measurable dependability. The necessity for constantly evaluating one's procedures in all parts of the employment process has been a minor theme running through this chapter. Before a man can be placed in a large commercial concern the nature of his prospective job must be clearly defined through a job analysis. Sometimes in making this job analysis the criteria by which satisfactory and unsatisfactory workers can be distinguished are unearthed. At other times it is necessary to make a special study to devise a criterion that reflects the important aspects of the job and, if possible, is not affected by the prejudices, biases, and unreasoned superstitions of supervisors. In many cases it is desirable to have a composite criterion which reflects more than one aspect of the job. Closely related to the determination of satisfactory criteria are the special problems associated with rating scales that are often used in lieu of more objective measures of an employee's work performance. The graphic form of rating scales is the most accurate for most situations, especially when properly constructed and administered to minimize the known sources of error. The interview conducted in "free style" has demonstrated its unreliability when unaided by devices such as a systematic outline of points to be covered. The application blank, long a mere record for the files, has in recent years developed into an important selective measure, especially in the insurance sales field. Finally, a wide variety of tests has been increasingly applied as an aid to selection. The particular tests used in any given situation are frequently "tailor-made," necessitating a rather lengthy and painstaking program of validation, starting with a great number of items and sifting out for final adoption those which correlate highly with the criterion but not with each other.

# Chapter 7

## TRAINING IN INDUSTRY

All commercial enterprises are faced with the necessity for training employees. Time alone takes its inevitable toll of skilled and experienced employees who must be replaced. A past generation of industrial managers was tempted to ignore or at least minimize the importance of training as specialization of manufacturing processes developed. When the handicraft arts gave way to the simplified tasks of mass production, the requisite skills in many areas of production decreased. However, the work of Taylor and Gilbreth on time and motion studies, to be discussed in the next chapter, drew attention to the importance of training even in the relatively simplified tasks of modern industry. These studies emphasized that maximum efficiency could be obtained only if each worker performed his assigned duties according to a precise pattern rarely discovered by the workman without guidance. The sudden conversion of American industry from peacetime production to war materials in 1941 again emphasized the necessity for well-organized programs capable of quickly adapting worker skills to new demands.

In addition to these considerations, it has become evident that skill in supervisory functions is of increasing importance. As an enterprise grows in its output or services, the supervisory personnel also increases so that more and more persons intervene between the policy-making general executives in the "front office" and the men and women who actually manipulate the goods manufactured or dispense the services sold. Under the older handicraft system fabricating the product was the principal skill required. Now, many persons employed by industry never touch the bottle

caps, the shoestrings, or the automobiles their organization turns out. They deal exclusively with human relationships. They coordinate, encourage, correct, and in other ways direct the efforts of others. Consequently, with the expansion of business organizations and the concomitant increase in supervisory personnel, has come the necessity for developing skill in handling people.

The present chapter is concerned with the problems and psychological principles of industrial training, reviewing first some of the basic principles that apply to all training programs and then considering the special applications in training (*a*) workers, (*b*) foremen and executives.

## 1. PRINCIPLES OF TRAINING

The principles of training which have application in industry are basically the same as those already discussed in Chaps. I and II. However, at the risk of repeating some of the material, it is necessary at this point to review the learning principles briefly, to clarify their applications in a new setting.

### *Defining the Objectives*

Every educational effort has some end in view, some objective toward which it is directed. Sometimes these objectives are well considered and clearly defined. More often they are vague, poorly defined goals, and because they are shadowy generalizations one is not sure when they have been attained. It is necessary both for the novice and those charged with the training program to have a clear conception of the precise skills to be attained, if the training is to be completed in the shortest possible time. It is not sufficient that a lathe operator be trained to "cut threads, turn a taper, and face flat stock." In addition the objectives should contain a statement of the limits of accuracy. Some plants require their operators to be responsible for routine maintenance, making minor repairs of their machines. If this is the case, obviously some clear statement defining the limits of these duties ought to be included in the objectives of the training.

The precise objectives of training for any specific task can usually be obtained from the job-analysis report (see page 157). Sometimes it becomes necessary to supplement this information by interviews



with workers, inspectors, or foremen. In many manufacturing jobs it is possible to use the job criterion as the measure of a novice's skill, merely setting a minimum level to be attained before he is "graduated" from the training program.

### *Incentives in Training*

Happily, the task of motivating young workers to learn a new job is less difficult than motivating many students in academic study. The rewards for success are usually much more immediate in the industrial situation than in college or university life. A study of the wages of learners in 410 representative American manufacturing concerns showed that a little less than one-fifth of the companies paid either the standard wages or the minimum wages of the job to novices.<sup>1</sup> It is consequently safe to say that most learners in industry are motivated to attain skill in their jobs by the desire for higher wages—a very immediate and effective reward.

Related to the question of precise objectives in training is the importance of providing the learner with information relative to his progress. Knowledge of one's progress is an important force motivating the individual to eliminate his errors and consolidate his improvement—provided he knows exactly what his errors are and what parts of the task he is performing correctly. This principle was utilized when special apparatus was constructed for teaching the simple task of filing a piece of metal. Levers attached to the stock, the vise holding the stock, and the file, were connected to pens resting on a moving tape. Variations in the positions of the pens indicated the length and timing of the strokes, the evenness of the pressure applied, and levelness of the file. The following figure shows how parts of the records look at the beginning of training and after thirty-two hours of practice.

The advantage of the apparatus lies in the clearness with which it shows exactly what aspect of the task requires additional training. In many jobs it is unnecessary to build elaborate devices for revealing special errors. The instructor is often able to detect weaknesses by simply observing the learner, but his skill as an instructor depends in part on the extent to which he follows the principle that corrections must be specific.

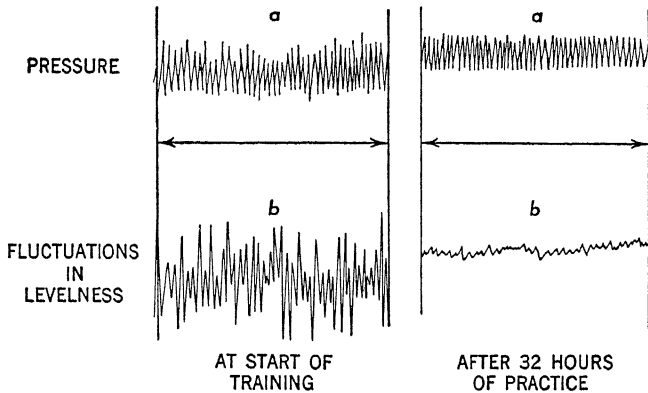


Figure 14. Showing a Record of Improvement in Filing. From G. Berling, "Planmässige Einführung des Menschen in den Industriellen Arbeitsablauf," *Ind. Psychol.* 1926, 3, 79-86; as reprinted by M. S. Viteles, *Industrial Psychology*, W. W. Norton & Company, Inc., N. Y., 1931, 409.

Instructional skill also depends upon the judicious use of praise and reproof. The preponderance of evidence from laboratory studies of learning tends to favor the use of praise rather than reproof in promoting learning. In commenting on the application of this principle to the industrial situation, Viteles remarks:

Punishment may not only be void of positive value, but may have the negative effect of inducing the worker to conceal his mistakes and adopt an unfavorable attitude toward the foreman and toward the plant. Rewards, on the other hand, not only strengthen the tendency toward correct performance but tend to build up favorable feelings.<sup>2</sup>

### *Accuracy vs. Speed*

Modern industrial operations are not only specialized but fast. This fact makes it especially tempting to emphasize speed rather than accuracy during the training period. From the standpoint of learning, this is an especially pernicious temptation. Most studies of learning manual tasks agree in suggesting that speed of action is a by-product of training that first concentrates on accuracy of movements. The confidence engendered by frequent errorless repetitions of the same actions reduces tension so that speed gradually increases without any special effort to attain it. On the other hand, when the initial emphasis is placed on speed, the novice is

likely to tense his muscles, frantically trying to gain a high level of production. Typical of the controlled studies on this problem is that one in which one group of typists was trained with emphasis on speed while a comparable group was given emphasis on accuracy. Four months after training began, both were tested. The speed group averaged 38 words per minute with 22 errors per 100 words, while the accuracy group averaged 45 words with only 1.2 errors in 100 words.<sup>3</sup> In most situations, high speed of action is possible *because* the actions are accurate.

### *Factors Opposing Progress*

Those who are not aware of the psychology of learning are likely to introduce procedures into an industrial training program which interfere with, or nullify the favorable factors. For example, in the later stages of training streetcar motormen, one company assigned the students each day to a different skilled motorman, who permitted the student to operate the car under normal traffic conditions. The purpose of this procedure was to permit student motormen to get acquainted with different routes, and, at the same time, profit from the combined experience of several men. From the standpoint of learning, the policy was probably a handicap, since it is well known among psychologists that such instruction given by several persons on the same skills is likely to result in habit interference. Suggestions given by one instructor may conflict with those given by another, in which case the inexperienced student is caught in a conflict which tends to inhibit progress.

Habit interference may also be involved when a given job calls for a variety of skills and all of them are taught at once. The tremendous expansion of industry during World War II focused attention on the need for rapid training—a need that was especially acute because of the sharply curtailed training programs of the previous depression years. In order to meet the demand for skilled workers, men have been trained on single-purpose machines until they are skillful enough to enter production work. A skilled machinist ordinarily can operate a drill press, a milling machine, or a lathe. To operate all of these machine tools with the necessary accuracy, required, under the older training system, an apprentice-

ship lasting at least two years. This long training period has been cut short in many plants during the war effort by teaching unskilled employees only a single machine and allowing them to go into production at the end of six or eight weeks. Undoubtedly part of this saving in time can be traced to the lack of habit interference found in the previous training methods.

The determination of how many skills can be taught at one time is related to the problem of whole vs. part learning, discussed in Chap. I, page 22. A great many experiments have been conducted on this point but those having direct implications for industrial training are limited. The bulk of the evidence appears to recommend teaching at one time all those skills forming an integrated functional unit. In other words, the whole method of learning is superior, provided the "whole" is a unit like butt welding that requires care in preparing the pieces to be welded, skill in operating the welding machine, some knowledge of metals and their heating properties. On the other hand, the tools and the skills demanded by arc welding are quite different and might properly be taught either before or after the trainee has gained considerable skill at butt welding.

Another factor tending to prolong unnecessarily the training period is the development of avoidable boredom, fatigue, or other adverse conditions that come from excessively long practice periods. The novice, in spite of his slower speed, consumes more energy per unit completed than the skilled operator. For this reason he is likely to fatigue more readily than the older, more experienced men. To offset these adverse conditions it is sometimes advisable to institute frequent rest periods or shorten the working day for trainees.

The adverse effects of too much practice in a limited time was shown by an English study in which subjects were employed at chain assembling. One group worked for eighty minutes in the morning and the other continued at the same task for an additional eighty minutes in the afternoon. At the end of two weeks both groups were producing at about the same speed in spite of the fact that one had received twice as much practice as the other. A follow-up of five of the subjects after a lapse of some months showed that neither group of subjects had reached their maximum

level in the initial training since all continued to improve during an additional two weeks of practice, reaching levels that surpassed any attained in the first training period. In this highly repetitive task doubling the practice periods failed to effect any noticeable improvement in output, even though improvement was still possible.<sup>4</sup>

### *Suggested Procedure*

In the light of these considerations it is pertinent to inquire, just exactly how should a machine operator be taught? The steps in industrial teaching are not quite the same as those in regular academic teaching of the sort discussed in Chap. II, even though the careful reader will see beneath the different terminology a striking similarity. The following steps have been suggested as desirable and are based on considerable experience rather than any formal experimentation with various methods:<sup>5</sup>

- a. *Explain* to the worker the nature of the work, hazards to be avoided, value of the equipment, the use of any special tools, specifications, gauges.
- b. *Demonstrate* the work with the learner in the position, as nearly as possible, that he will assume when he performs the same task.
- c. Permit a *trial* under the direct guidance of the instructor.
- d. *Correction* by the instructor of this initial and subsequent trials.
- e. *Follow-up* not only during the period of primary training but at subsequent intervals to avoid the formation of inefficient habits.

A useful aid in teaching is the motion-picture projector. Not only is it possible to demonstrate the best methods of work by means of well-edited movies, but they may be used to give an overall view of the plant operations showing how the trainee is contributing to the end result. During the war emergency a number of films have been produced with the help of the United States Office of Education for the purpose of speeding the training of defense workers. One of the best efforts along this line is a series of five films dealing with shipbuilding covering such skills as welding, blueprint reading, and accurate carpentry as applied to the preparation and setting of a keel block and bottom cradle, the construction of inner bottom sections, the subassembly of closed and solid floors, web frames, deck girders, and similar matters related to shipbuilding. In training machine-shop men, films entitled "Steel Rule," "Micrometer," "Fixed Gauges and Standard

Indicators'' have aided the war effort. A film has even been prepared to teach foremen how to teach. The extensive use of such training films is revealed by the fact that one company has produced and distributed over 12,000 prints.<sup>6</sup>

Among the learning principles important in industrial training, then, is the necessity for a clear statement of objectives; a strong motive (usually the desire for higher wages); correction of specific errors; the judicious use of praise; and emphasis upon accuracy rather than speed. A factor tending to oppose improvement is habit interference, coming either from conflicting instruction or from attempts to teach simultaneously a number of unrelated habits. Another factor thwarting improvement is the relative rapid increase in fatigue among novices, making it advisable to shorten the learning session in some cases.

## 2. TRAINING WORKERS

One of the initial questions facing any concern wishing to establish a training program is the issue as to precisely what kind of teaching organization is to be utilized. At least two major procedures are followed throughout industry. Training is given either in a "vestibule school" or on the job, or by a combination of these two methods (apprentice training).

### *Vestibule School*

The vestibule school is a training setup with its own quarters, personnel, and equipment. New employees are first assigned to the vestibule school before being permitted to enter the regular manufacturing division. Ordinarily, the aim is not to develop all-around craftsmen but rather to teach the candidate to operate a single-purpose machine. As previously indicated, this kind of training is especially useful in periods when a rapid expansion of industry calls for a large number of skilled men to be trained in a short time. Indeed, vestibule schools first gained favor just prior to World War I. Although they have again increased in number in World War II, they were in force in only about 9 per cent of the companies surveyed by the National Industrial Conference Board in 1937.<sup>7</sup>

Where a sufficient number of trainees are constantly coming into

an organization to warrant such a school, a number of advantages are apparent. Specially trained instructors are provided, as well as a relatively quiet, unhurried atmosphere conducive to learning. The regular supervisory staff attached to the manufacturing division is relieved of the teaching duties, enabling them to devote their full time to their principal tasks. Trainees, moreover, are taught the approved methods rather than copying the unauthorized short cuts of the older workers. Under the vestibule system production is not impeded by the delays and spoiled work of the novice. This has special significance on tasks where a gang works together on a group payment plan of wages. Next, the instruction is more likely to be personalized and more thorough under the full-time instructors rather than under the divided attention of the foreman. Demonstrations before a group, of right and wrong methods, are much more conveniently handled in the school than on the job. Finally, a regularly established vestibule school may be used in slack times to retrain older men in newer methods or to increase the versatility of other employees.

It is quite evident from this list of advantages that vestibule schools, in spite of their unpopularity in so-called normal times, merit considerable attention. The chief argument directed against them is their cost, since duplicate machines and a special training force are necessary. Both of these arguments take on considerable weight when the operations required of a given man are diversified and the machinery is expensive. Moreover, in practice it is difficult to find instructors who constantly keep abreast of changes in manufacturing processes and skills and who are also good teachers.

### *On-the-job Training*

The most general form of training in American industry is to place the new employee with a skilled workman as a learner or helper. In some instances the foreman takes the responsibility of "breaking in" the new man and then turns him over to an experienced worker who continues to guide his learning.

The chief advantages of this system are its simplicity and alleged economy. Certainly the known costs of on-the-job training are small, partly because the trainee is contributing to the total out-

put while he is learning and no special instructors or equipment are necessary. On the other hand, the hidden costs of the system may be quite sizable if consideration is given to the total time lost from production by foremen and others who must instruct the trainees. There is the further possibility that the emphasis on speed, which regular production work is bound to exert, will ultimately result in poorly trained men. When new men are assigned to experienced workers there is less possibility of standardized instruction than in the vestibule school. Perhaps offsetting some of these disadvantages is the fact that whatever the candidate learns will very likely be immediately related to his job. In addition, his adjustment to fellow workers and the supervisory personnel is not delayed but develops along with his job skill. In small plants where only a few novices are introduced at a time, on-the-job training is probably the only economical procedure to follow. However, possibly several such enterprises might pool their training resources in a central vestibule school for their mutual benefit.

It is significant in evaluating these two methods of training that a number of defense-industry companies like Pratt & Whitney used the "watch-the-man-who-knows-how" method in the early days of the World War II, but discarded it because trainees hesitated to interrupt production men to ask questions and then rarely reached normal production speed because they were afraid they might spoil materials. This company found that a course lasting 325 hours, consisting of classroom and shop training under the direction of full-time teachers, provided both faster and more thorough training than the previous methods.<sup>8</sup>

### *Apprentice Training*

The apprentice system of industrial training in the handicraft era was the only available means of obtaining a "trade" skill. In recent years the system has been alternately condemned and encouraged. In some trades the apprentice has been a source of cheap labor who was given very little actual instruction. Instead, he merely "served his time" under a craftsman, picking up scraps of information as best he could. In some cases a signed agreement or "indenture" bound the apprentice to perform certain menial



tasks at the behest of the draftsman without placing responsibility for instruction on the experienced man.

In 1934 the Federal Committee on Apprentice Training was established to stimulate wider adoption of apprenticeships among employers, especially large industrial concerns. Standards for training were drawn up and recommended to all those who assumed responsibility for apprentices. This effort to encourage apprentice training had begun to show its effects before the rapid expansion of industries at the outbreak of war in 1939. A study by the National Industrial Conference Board revealed that 57.5 per cent of 473 companies questioned had some regular form of apprentice training. Most of these, however, were in the metal-working industries and most of them required four years of service. On the other hand, the total number of apprentices in these companies amounted to only 1.1 per cent of their aggregate employees.<sup>9</sup> It has been estimated that about 5 per cent of industry's skilled labor is lost each year through death, old age, obsolescence, or voluntary retirement. This is about five times the number being trained to replace them. These statistics clearly indicate why the United States, in spite of the Federal Committee's encouragement, was short of skilled workers at the beginning of World War II.

A number of suggestions have been made to improve the apprentice system and to nullify the usual objections raised against it. In brief, these reforms call for: (*a*) careful selection of candidates through the use of appropriate psychological tests and other reliable devices; (*b*) job training supplemented by classroom instruction on company time; (*c*) advancement according to demonstrated ability and not according to time expended; (*d*) the use of manuals and textbooks showing levels of skill to be attained at each stage of progress.

A well-planned and administered apprentice program has a number of distinct advantages for both the employee and the company operating the program. For the company it insures a steady flow of new skilled men to replace those who retire. (The indenture sometimes binds the apprentice to his company for a stated time after graduation from the program.) The graduate apprentices are versatile in their skills, making it possible to change

designs and methods of production with a minimum of worker confusion and retraining. The workers themselves, because of their versatility, are less susceptible to technological unemployment. (See chapter on Vocational Guidance, page 484.) Moreover, the apprentices are paid while learning and are motivated to obtain higher wages upon graduation. Finally, in such a system there is a maximum opportunity for integrating academic theory with practical production problems, often leading to improvements in the solution of the latter.

### 3. TRAINING FOREMEN AND SUPERVISORS

The necessity for special training of foremen and other supervisors has been increasingly recognized within recent years. Top executives and managers have more and more realized that a foreman must be something more than just a skilled and energetic worker. Indeed, some excellent craftsmen make poor foremen, and some excellent foremen were previously mediocre workers. This apparent paradox becomes less paradoxical when it is remembered that as soon as a man is moved from a production assignment to a supervisory position, he is not so much concerned with manipulating materials as with manipulating men.

Foremen especially are in a strategic position, for they are the final link between the policy-making, planning personnel and the men who actually do the main work of the organization. As such, they may nullify all of the previous planning and supervisory efforts by their inexpert transmission of directions. Retirement plans, hospitalization provisions, recreational programs, and other morale builders can be immediately sabotaged by a foreman's overbearing, browbeating, treatment of his men. Bungling treatment of the minor day-to-day wrinkles in the otherwise smooth operation of the manufacturing process may seriously impair output.

The training of foremen is a special problem not only because of their unique strategic position, but because they are almost universally promoted from the ranks. In stepping out of the production line, the new foreman's loyalties, which previously were mainly with his fellow workers, must now be directed in a larger measure toward the company. The transition from worker to foreman is one calling for considerable diplomacy and tact, so as

not to offend friends and yet maintain the requisite authority and respect. In the past the typical foreman was a grade-school graduate with a better-than-average shop skill and a good "drag with the front office." Once he received his promotion it became evident (to himself) that he was a self-made man whose opinion had the weight of an oracle. Such men without training could hardly be expected to make the transition from worker to boss smoothly.

### *Duties of Foremen*

In order to understand better the objectives involved in training foremen, it is necessary to consider the duties ordinarily required. An analysis of foremen in representative companies resulted in the following classification of tasks:

*a. General.* Knowing the department rules, enforcing them, setting an example for others in behavior and care over company property, accepting and carrying out orders, and cooperating with other departments when the situation arises.

*b. Technological.* Keeping machines, tools, safety devices, and equipment in proper condition; inspecting and recording the raw material or the finished product and properly storing it; planning ahead for the most efficient use of men and tools; helping develop standards for selecting and testing materials; and offering suggestions for improving processes, designs, and equipment.

*c. Economic.* Conserving power, gas, light, water, raw material, keeping records and making reports of attendance, complaints, shortages; supplying time and cost data to the planning, accounting, and personnel departments; holding up questionable work and enforcing company standards, and arranging work in their own departments to avoid confusion and to make the most efficient use of equipment.

*d. Personnel.* Interpreting management to men by explaining company policies, incentive systems, safety and welfare programs, and by clarifying published statements; representing men to management by presenting their views, capacities, and attitudes in an unbiased manner, helping the training program by encouraging participation and by selecting the more promising men for special training; cooperating with the employment department by giving exact specifications when men are needed, and with the personnel department in rating each man and in selecting those worthy of promotion, and with the safety department in enforcing rules, reducing accidents, and in maintaining first-aid facilities; maintaining discipline in a manner which will ensure the cooperation of all workers; and in improving their own efficiency by constant study, participation in conferences, and visits to other divisions.<sup>10</sup>

The magnitude of these duties further emphasizes the strategic importance of the job and the necessity for training. The foreman is frequently like a man caught in a squeeze since he must represent the management to the workers and on other occasions accurately

picture the attitude and feelings of his men to the management. However, in spite of the obvious need for foremanship training, an investigation by the Minnesota Employment Stabilization Institute disclosed that only 62 of the 690 business establishments surveyed provided training for supervisors and foremen.<sup>11</sup> More recently the Training Within Industry section of the War Manpower Commission devoted a year to the development of a course for foremen desperately needed in defense industries.

### *Methods and Content of Foremanship Courses*

The particular methods used in training foremen and other executives vary considerably from one organization to another. Generally speaking, they fall into two loosely defined classes—the lecture-and-conference type, or the “flying squadron.” The latter method is best exemplified in the Goodyear Tire and Rubber Company, where in 1913 a number of promising men were organized into a squad to be shifted frequently from one job to another. The idea behind this plan was to familiarize the potential leaders of the organization with the whole plant, enabling them to understand a wide variety of operations and the importance of integrated efforts in all departments. A very important side benefit from this system lay in the use of the flying squadron to speed production in those departments temporarily short of men because of illness, displacements, and other reasons. A number of other organizations have found the flying-squadron system or some modification of it useful in training foremen, supervisors, and junior executives.

The lecture-and-conference type of training is by far the more prevalent. One of the chief difficulties in this method is the development of suitable curricular material. Recalling a section of Chap. II, it will be remembered that it is desirable to start the learning process with problems drawn from one's immediate environment. It may seem strange, but it is none the less true that foremen and junior supervisors often fail to recognize problems which are rightfully theirs. S. Bigelow, of the Sales Analysis Institute, a commercial concern specializing in training personnel, has cited instances in which foremen and other supervisors either believed they had no problems or else thought their problems were unsolv-

able. One group of twenty-five plant superintendents, when asked to write their problems for purposes of analysis, could not think of a single difficulty. It later developed that the difficulties they were actually facing in their jobs were thought to be the responsibility of superior executives. Fundamentally, they were unskilled in seeing their own problems as such.<sup>12</sup> Once the real, everyday problems of supervisors are located, then the lectures and conferences can be centered around these problems and ways of handling them. A very careful analysis of the most frequent causes of ineffective supervision in the Eastman Kodak Company disclosed that they fell into three general groups:

1. Insufficient knowledge of the company's aims and desires or policies as they apply to each class of work and job.
2. Lack of definite knowledge of the individual's responsibility and authority—that is, the exact scope of his job.
3. Lack of knowledge of interunit and interindividual relationships that grow out of these responsibilities.

These problems then were translated into units of study, each carefully worked out in advance with discussion questions and a statement of the management's views, for the benefit of the discussion leaders. The five units of study were:

1. The principles of organization.
2. Personnel problems dealing with the handling of men and employee relationships.
3. Cost control, concerned with the efficient use of equipment, materials, and labor.
4. Quality control or the problems of inspection and holding to established standards.
5. Scheduling and the necessity of integrated production from all departments so that one section of the organization is not overworked while others are shut down.

These topics are representative of the kinds of curricular material usually found in many foremen-training classes. The second of these units is the only one in which the psychologist can be of service, but it is in this area that the most stubborn problems develop. The course developed for foremen by the War Manpower Commission, referred to earlier in this chapter, attempts to give

five pieces of advice to make the foreman-worker relationship a cordial one. They are:

1. Let each worker know how he is getting along, figure out what you can expect of him, point out ways in which he can improve.
2. Give credit when due, look for the extra or unusual performance, such as good attendance, and tell the worker when the performance "is hot."
3. Tell people in advance about any changes that will affect them, and why they have to be made, if possible. Get the men to accept the changes.
4. Make the best use of each person's ability and look for abilities not now being used.
5. Never stand in a man's way for a promotion.<sup>13</sup>

The experience of most companies indicates the desirability of promoting as much relevant discussion as possible among the foremen, rather than using formal lectures as the instructional means. The extent to which foremen participate in such discussion is in a large measure dependent upon a number of features of the presentation. Some experience indicates that the usual recitation methods of high-school and college classrooms are not especially well suited to adults. Even though a text may be part of the course equipment, it is usually not wise to quiz the men to make sure they have read it. This approach is likely to engender feelings of resentment and may effectively dampen any enthusiasm the group may have at the outset.

Sometimes the leader of a foremen's training class may be tempted to disclose the exact attitude of management on any particular problem in order to keep the discussion on the point. If the leader succumbs to this temptation he is likely to find that the discussion immediately ceases. For example, the purpose of a problem might be, "To show that the supervisor is responsible for, and his relation to this situation is so and so . . ." If the problem were presented in that fashion very likely there would be less discussion than if the leader were to phrase the purpose: "To determine the supervisor's responsibility for, or relationship to, a given situation." The latter statement stimulates a search for the proper relationship while the former suggests that the group leader is about to tell the foreman why a policy has already been established. To be most effective the conference-lecture type of

training might be built around the immediate problems of the foremen and should stimulate discussion and thinking.

### *Some Psychological Principles for Supervisors*

It is beyond the scope of this chapter to do more than outline some of the psychological principles which supervisors may find helpful in reducing the friction of human relationships. These considerations might well find a place in that part of the foremanship course devoted to personnel problems.

First, foremen as well as others in supervisory positions must be vigilant to prevent their own personal prejudices from intruding upon their dealings with the men. The extent to which these prejudices may disrupt a department is revealed in the following case, as reported by Benjamin M. Selekmán.

In one department of a factory that became the scene of a succession of sharp disputes, for instance, the foreman was an excellent craftsman. He knew every detail of the manufacturing process, and possessed the ability to transmit instructions to the workers under him with unusual clarity and precision. The company corroborated, and the men did not challenge his claims that he had eliminated many wastes and yet had shown his men how to increase their earnings. But as the first dispute came up for arbitration, although it centered upon issues outside the foreman's jurisdiction, the hearing immediately uncovered the mutual antagonism and contempt existing between this foreman and the men. Subsequent interviews proved that the actual public interchange of charges merely made explicit an entirely extraneous emotional clash. The majority of these workers were Italians. the foreman was a German. He made no secret of his disdain for all Italians; his smiling description of himself as "the only white man in the shop," epitomized his prejudice. His eldest daughter was married to an Italian and according to his story, unhappily married because his son-in-law was "just another one of them"—of this "irresponsible, inferior people."<sup>14</sup>

This case, like a great many others of antagonism in the presence of what appears objectively like competent supervision, demonstrates the necessity of personal compatibility of the foreman with the group to which he is assigned.

Second, foremen who are successful, "sell" their orders rather than dictate. The American Rolling Mills Company has empha-

sized this aspect in their foremen training programs where the candidates are taught to analyze each objection from the workman's viewpoint and are thus enabled to handle complaints to the satisfaction of both management and the men. This has resulted in increasing the prestige of the foremen in the eyes of their men, since the approach is one of encouragement rather than gruff "hard-boiled" treatment. One example of the application of this approach is the report of a workman who complained to his foreman because the bonus for the gang was not up to previous periods. A change in processing practice had necessitated adding a man to the crew to gain unusually high quality demanded by a special order. Before training, the foreman, when faced with such a complaint, was likely to respond in a vein somewhat as follows: "Yeah, I know your bonus is low. Don't you suppose that I check the different jobs? I've got plenty of headaches over the low efficiency on this job. If you guys would get the lead out of your shoes you could make more bonus, and I wouldn't catch so much blame from the boss." Instead, he agreed that the lower bonus bothered him too, and had tried to find some solution to the problem, but knew of no way of increasing the efficiency without decreasing quality. He then asked the workman if he had any ideas for distributing the work so the extra man would not be required. The workman came back almost at once with, "Why not move those controls from the pulpit to the leveler, then I can handle both jobs and do them as easily as I'm doing this one." The idea was entirely feasible and not only cut production costs but increased the bonus of the gang.<sup>15</sup>

The foreman who complains because he does not have enough authority probably should not be a foreman. A survey of foremen, and workers of equal job skill to the foreman, showed first, that approximately three out of four workers preferred the "suggestion-selling" approach when being given instructions or orders by foremen. The latter when questioned about the best methods of handling subordinates tended to advocate the use of praise for jobs well done, to consider individual differences, and to practice suggestion rather than the stricter method of the traditional army sergeant.<sup>16</sup> The bosses who wear well with the men and the management rarely use their authority. Instead, their chief tool is the



good-natured respect they earn from their men through the respect they give to the workers' interests, ideas, wishes, prejudices, hopes, and anxieties.

A third practical principle is to deal with complaints and grievances as quickly as possible, consistent with justice. Most large companies provide foremen with sufficient power to settle the majority of the grievances, even though lines of appeal from the foreman's decision are clearly outlined and open to virtually instant use. In the General Electric Company, 95 per cent of all complaints in recent years have been ironed out by the foremen. Grievances that are ignored or dismissed without a hearing become festering sores in industrial relations that may lead to costly and disastrous conflicts. The following statement by one of the workers on strike at the Lackawanna Plant of the Bethlehem Steel Company in the last week of February, 1941, is quite revealing on this point:

We work on a piecework system. You never can tell what you ought to have in your envelope or what you will have. That's one grievance. Then there's too much dust. We got no place to eat lunch. Men that get hurt are promised jobs, easy work—but they don't take them back. But most of the complaints are about wages. We don't get as much as they get in other companies. We know that. But we don't know how it is figured. The union tried to send in a grievance committee. But they wouldn't meet with us.<sup>17</sup>

The primary complaint from this man's point of view was, "By what system of figuring am I paid?" When he tried to find out, he was blocked, or at least so he believed.

One of the principal factors contributing to the fine labor relations in the Studebaker Company, a member of an industry unusually troubled by labor disputes, is the quickness with which sources of possible friction are diplomatically handled. The man in charge of the Industrial Relations Office spends most of his time in the plant conferring with foremen and workers on all manner of personnel problems. If disputes cannot be settled through this office they may be referred on up to the president of the concern. To illustrate the closeness with which the top management keeps in touch with shop affairs is the story told about Mr. Paul G.

Hoffman, then the new president of the company. He was advised to discharge two or three men who had been making disparaging remarks about the cars they were building. Instead of following the advice he took one of his frequent walks through the plant and within earshot of the alleged critics he told the foreman that an automobile is precisely as good as the workmanship that goes into it.

"If there is anything wrong with these cars, let's fix 'em," said Mr. Hoffman in some heat. "If not, let's sell 'em." The confidence in the men expressed in that statement, the diplomacy of the action, the absence of rancor, the earnestness and decisiveness of the man, all contributed toward healing an incipient sore spot.<sup>18</sup>

Fourth in the list of generalizations for supervisors is the fact that men like to be treated as individuals, not as so many "hands" or as mere adjuncts to machines. The temptation to think of men in this manner stems in part from the very nature of many industrial operations—operations which according to Taylor should be so simple that a trained gorilla could perform them. The attitude clearly expressed by the statement, "Hey, you there . . ." fails to engender much of a will to work. It robs the man of individuality and any sense of responsibility. If no interest is shown in his off-the-job problems, his efforts at self-improvement, the difficulties of meeting his bills and rearing a family, there will be little reciprocal interest in the job. Some well-intended supervisors have made the mistake of appearing to be "nosy" and inquisitive when they made halting efforts to gain some information on their workers' personal problems. Rather than make the initial move in matters of this sort, successful foremen have merely encouraged their men to talk freely whenever such topics happened to come up. The recognition of the dignity of the individual is probably at the bottom of the "family spirit" so often talked about but often absent in many industrial organizations.

These four principles of foremen-worker relations are by no means the only ones that are applicable. Others may suggest themselves. However, they represent the kind of relationship that goes far toward reducing the tensions and conflicts thoughtlessly engendered by untrained supervisors.

## 4. SUMMARY

The most important principles of learning as they apply to the problem of training industrial workers and foremen have been given briefly. Primary consideration has been given to the effect of motivation, specificity of instruction, the need for early emphasis on accuracy, the possible deleterious effects of habit interference, and prolonged training sessions. The special advantages and disadvantages of the three principal types of training programs have been discussed. On-the-job training, especially for highly skilled work, is perhaps the least efficient procedure. When workers are needed in great abundance within a short time, the vestibule school meets the need most completely. In other circumstances the improved apprentice systems hold considerable promise.

The training of foremen and supervisors was discussed in the light of their special duties and the unique type of individual often found in those positions. Although there is little standardization in the content of foremanship training courses, they are conducted for the most part in lecture-conference groups. Suggestions have been made as to methods for selecting curricular material. In addition some discussion of the principles to bear in mind in connection with foreman-worker relationships has been presented.

# Chapter 8

## EFFICIENCY IN PRODUCTION

The relatively high standard of American living is largely the result of the ability to produce quality goods at a low cost per unit. This has been accomplished even with higher wages than were paid foreign labor because American industry, including the workers, are in general more efficient. That is, Americans produce more airplanes, more cigarettes, more razor blades, more yards of mosquito netting, more cans of soup; in short, more units per man-hour than less efficient industrial competitors.

What are the factors which contribute to, or constitute this efficiency? Are American workmen of a different biological stripe so that they tire less readily, or work harder, or are better physically adapted for industrial activity? Probably not. The average American worker is not essentially different physically from the Chinese coolie. The secret of American efficiency lies in two factors: first, the development of automatic machinery and second, the persistent attempt to adapt work and machines to the workmen rather than bending men to the machines. It is this latter aspect which will be examined, for here is where the psychologist is more concerned. Moreover, probably the greatest future advancements in industrial production efficiency will come in this area.

### 1. DEFINITION OF HUMAN EFFICIENCY

The term "efficiency" has been borrowed from the physical sciences, where it means the ratio of input to output. The efficiency of any machine may be expressed as a percentage, the energy expended (input) on the machine being divided into the energy or work derived (output) from the machine. In order, therefore, to

determine the efficiency of a machine a simple calculation is made using just two variables, input and output.

Such simple calculations are frequently impossible when dealing with human efficiency. The total input of the human organism is difficult to measure. The same is true of output, since human beings expend energy in so many different ways at the same time that attempts at measurement usually fail to capture all of it. For these reasons it is often necessary to speak of more or less human efficiency rather than efficiency of a given per cent.

The definition of human efficiency which is perhaps most useful for this discussion has been suggested by Poffenberger.<sup>1</sup> Perfect human efficiency is reached with the production of the maximum output of the highest quality in the shortest time, with the least expenditure of energy and with maximum satisfaction. Maximum human efficiency, therefore, cannot be a simple ratio but is a resultant of a number of dissimilar factors, some of which virtually defy quantification. In spite of these limitations a careful scrutiny of many work situations enables one to make a fair judgment as to the degree of human efficiency. In the sections that follow are given some attempts to measure aspects of input and output in order to discover whether efficiency has increased or decreased as the result of changes in work conditions. Such studies provide conclusions pertaining to relative rather than absolute efficiency.

## 2. INSTRUCTIONS TO MEN

The efficiency of a skilled worker starts with the instructions he receives. By "instructions" is not meant the kind of training received prior to assignment to the shop. That problem was discussed in the previous chapter. Here the reference is to the competent workman operating the lathe, the spinner, the stamp press, or other machine to which he has been assigned and the instructions which come to him from time to time with respect to the actual work he is to do.

Twenty-five or more years ago the milling-machine operator was very often given a hastily drawn sketch, details omitted, with the order to "make one like it." The operator was then expected to select his materials from the storeroom, pick up his tools from the tool crib, plan the steps for production, ask advice from his

foreman and eventually turn out an object which resembled the original sketch. More than likely the end product would only approximate the designer's conception of what was wanted.

Few profit-making concerns operate today in such a disorganized fashion. In the first place, the watchword of many shops is V.O.D.G. (verbal orders don't go). Blue prints and photographs have largely displaced penciled sketches. Attached to these is a supplementary instruction sheet that is a complete compendium of information concerning the name and number of materials, tools, machine speeds, depth of cut, order of operations, and sometimes the wage rate. The aim of these sheets is to make perfectly clear what is expected of the workman. Confusion on this score may lead not only to spoiled materials but, more important, to lower morale because of arguments or bickering between foremen and workers as a result of misunderstandings.

Some instruction sheets make use of the oft-quoted principle that a picture is worth a thousand words by including at least a diagram of the control levers set in position for the job, and by illustrating where the operator is to place his feet, hands, and sometimes even his fingers to ensure maximum production in the easiest way.\*

To those unfamiliar with the work of time and motion studies, the last of these instructions may seem pedantic or silly. To appreciate the importance of these minute details attention should be given to a very interesting aspect in the development of present-day industry.

### *Contributions of Taylor and Gilbreth*

Frederick W. Taylor became a pioneer in the field of scientific management through a careful analysis of the very simple job of handling pig iron. His study was made in the plant of the Bethlehem Steel Company where a gang of about seventy-five men spent their day lifting pigs with their hands and carrying them onto a railroad car. The work was simple, crude, and elementary. From the gang Taylor selected one man for intensive training in the science of handling pig iron. Before training, this man carried an

\*This practice has met with some disfavor among supervisors and foremen of long service who remark: "There is too much paper work and red tape nowadays."<sup>2</sup>

average of  $12\frac{1}{2}$  long tons per day. No one (except Taylor) ever expected this man's "production" could be boosted beyond 20 or 25 tons per day.

The laborer's cooperation was obtained partly through assuring him more money for more "production." During the training he was told not only how to work but, possibly most important, when to rest. At the end of his training he was able to load  $47\frac{1}{2}$  tons per day—a production which he consistently maintained during the following three years of observation by Taylor.

From this initial investigation grew the practice of time study; that is, the careful examination of industrial operations in order to speed production without appreciably increasing fatigue. Frank B. Gilbreth and his wife Lillian Gilbreth, who worked independently of, but contemporaneously with Taylor, were largely responsible for the initial attempts to eliminate unnecessary and wasteful motions. These two movements—time study and motion study—soon fused together and have been responsible for the development of a number of principles of work which have wide applications.

### 3. TECHNIQUE OF MOTION STUDIES

Principles of motion economy have been developed largely through a picture analysis of industrial operations. The first pictures were made under somewhat unusual conditions. A small electric light was first attached to the worker's hand. During a simple operation the camera shutter was opened for two or three seconds or until the operation was completed. Upon development, these pictures showed in white lines the precise path followed by the hand. Such single-frame pictures do not give an accurate record of motions toward or away from the camera. However, if a stereoscopic camera—one that takes two pictures simultaneously from slightly different points—is used, the resulting pictures can be viewed through a stereoscope.\* The third dimensional movements are then readily seen.

For operations extending over a longer period, motion pictures

\*These were familiar devices a generation ago in most households. They consist of an eyeshade holding two low-power prisms through which cards are viewed. The cards consist of two nearly identical pictures of the same scene, which when viewed through the stereoscope fuse together to give an impression of depth.

are made—usually without a light attached to the principal moving member. Frequently a split-second clock is included in the scene photographed so as to make a time record of each movement. Here again the stereoscopic principle can be employed to get a full detailed analysis. In order to make a record that can be studied leisurely and carefully, each frame of the film is projected as a “still” picture on a cross-sectioned screen, and the position of the principal moving member is plotted. Each successive frame is treated in the same fashion. When the plot is finished, a chart is available showing by means of these dots the exact path of the movement.

#### 4. CONTRIBUTION OF MOTION AND TIME STUDIES

##### *Tension and Ballistic Movements*

Among other things, these kinds of data revealed that skilled, fast workers made few jerky movements. For the most part the movements were of a free-flowing, ballistic type characterized by sweeping curves, terminating at the points of grasping or releasing the piece of work. One important aspect of this discovery is its confirmation through several very carefully controlled laboratory studies which throw light on the probable reason for fast workers unwittingly adopting such free-flowing movements. Stetson and Bouman<sup>3</sup> describe a ballistic movement as one in which “the limb is made to swing on the pivot joint by a sudden unopposed contraction of the driving muscles”. And later: “During the median part of the excursion both muscle groups are relaxed and the limb swings free under momentum. If the antagonistic muscles act at all they do not contract until the end of the movement. The ballistic movement is a momentum movement.”

Thus if ballistic movements are those that are started by a sudden muscular contraction and then allowed to “coast,” it is reasonable to suppose that they consume less energy than nonballistic movements in which most if not all muscles attached to a moving member are under varying and changing degrees of tension for the duration of the action. Hence, ballistic movements are probably less tiring, and for that reason the skilled worker can maintain a faster pace throughout the day.



A second laboratory study<sup>4</sup> which supplements the above shows the development of ballistic movements in connection with a pursuitmeter problem. Persons beginning the task invariably employed nonballistic movements, whereas mastery of the task was accomplished by the acquisition of ballistic movements.

It may, therefore, be concluded with reasonable certainty that at least one of the factors contributing to efficiency is the development of ballistic movements. Skilled workers as measured by production figures are such partly because they use sweeping, free-moving ballistic actions that are probably less energy-consuming.

A practical test of this deduction is found in a report of coal miners who were coached to use ballistic movements in swinging the pick. A circular movement was recommended such that the pick was swung in an arc from the point where it last struck to the next point of contact. Thus the energy required to stop the momentum of the pick when it is ordinarily lifted above the head and restarted on its downward path was saved. Lifting and reswinging the pick became a single circular movement rather than two movements separated by a momentary pause. The miners apparently liked this suggestion which was partly responsible for an output increase of 16 per cent <sup>5</sup>

### *Wasted Movements*

Motion studies of the kind described above have also revealed a large number of useless movements that were less obvious than those of the soda clerk making elaborate gestures or the bootblack slapping his rag. Gilbreth showed, for example, that many motions involved in spreading mortar in bricklaying are unnecessary if skill is attained in throwing the mortar from the trowel. Furthermore, cutting off and trimming up excess mortar can be done in one motion for every two bricks laid rather than after each brick is in place. As a result of making other changes in the work methods, Gilbreth reduced the number of movements in laying one brick from eighteen to four and more than tripled the number laid per hour. Motion-study principles have been applied to a vast array of industrial operations with similar beneficial results.

*Proper Placement of Materials and Machines*

These motion studies soon revealed that not all unnecessary movements were attributable to inefficient working habits. More often materials were haphazardly arranged or machines were built with little or no regard for the men who had to operate them.

One concern was very proud of the speed with which its carburetor assembly was being done. Arrangements had been made to provide each man with a tray containing all the necessary parts for a single unit. When Gilbreth was called in to examine this operation and improve upon it, he merely recommended a compartmentalized tray designed in such a fashion that the first part required to start the assembly was always placed in a given spot and right next to it the second part necessary, and so on. The assembly time which had been thought very fast was cut in half by making these changes.

Arrangements of this type have several advantages. First of all, they eliminate searching for particular pieces. Time is consumed in fingering and brushing aside flanges, washers, or nuts in search for a cotter pin. Second, the worker is also relieved of the necessity for making decisions each time he is about to select an additional piece. His tray is arranged and filled in such a way that he need merely follow a predetermined pattern around that tray and pick up each part in succession. Little or no thought is required once the pattern of the tray is learned. The reaching and grasping actions may become almost as well directed as the finger movements of a skilled typist in hitting the keys.

More recently sloping bins arranged in a semicircle around the assembler's immediate working space have taken the place of trays such as described above. These have the advantage of not requiring as much attention from the supply clerks and can be arranged in a more compact unit within easy reach of the proper hand.

Machine design and arrangement have also been affected by time and motion studies. Many shops of twenty years ago were a maze of overhead drive shafts, pulleys, wheels, and belts. These long drive shafts extending perhaps from one end of a large room to the other dictated the position of every machine—all had to be

arranged along these shafts, row upon row. With the development of decentralized power sources—that is, electric motors built into each individual machine tool—it became possible to arrange machine shops more efficiently.

Several machines placed to form a triangle or square could be operated by a single worker with little wasted walking, as illustrated in the following diagram.

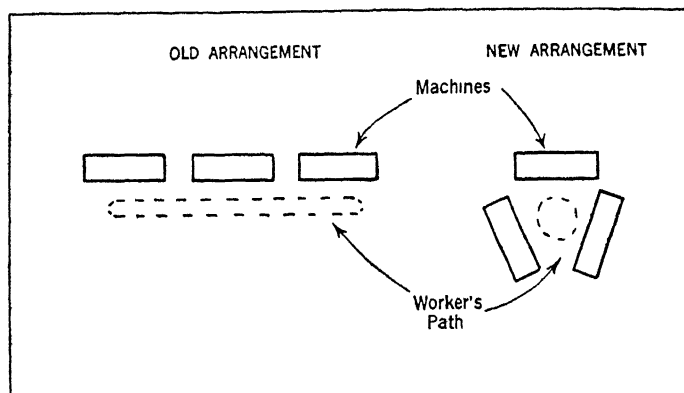


Figure 15. Showing How Arrangement of Machines Contributes to Efficiency.

One of the most glaring examples of inefficiently designed machines is the typewriter with the universal keyboard. The principal difficulty in this case is that the "work load" is distributed among the fingers without regard to their normal work capacity. The unevenness of the work load is clearly shown in the right portion of Fig. 16. Moreover, the work load of the left or nonpreferred hand is noticeably greater with the universal keyboard.

A number of new keyboard arrangements have been suggested from time to time. Recently introduced into the offices of the Navy Building at Washington is the Dvorak keyboard, probably the best considered of all the proposed revisions. The arrangement of keys according to the system is shown in the left portion of Fig. 16. It is evident from the figure that the new design distributes the work load more evenly and gives a greater load to the hand usually preferred. On the basis of a great deal of research the proponents of

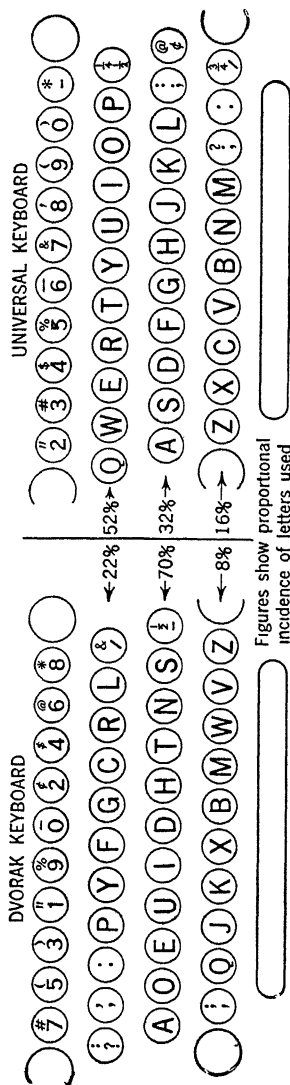


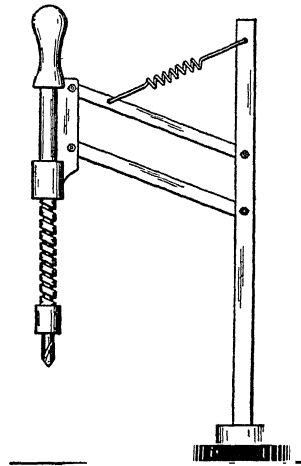
Figure 16 Showing Contrasts between Universal and Dvorak' Typewriter Keyboards. Figures on Each Hand and Length of Fingers Indicate Amount of Work Performed. Courtesy of A. Dvorak

the Dvorak design claim it is superior to the older arrangement in being

1. Easier to master, requiring less time to attain a particular level of speed.
2. Faster, since it makes higher net rates possible for average typists.
3. More accurate.
4. Less fatiguing.<sup>6</sup>

Related to the general problem of machine design and arrangement is the practice of prepositioning tools. By prepositioning is meant placing tools or materials in such a position that they are ready for use. The most common example of prepositioning is found in the modern desk holders for fountain pens. For small assembly jobs requiring the use of a screw driver, arrangements such as illustrated have been found convenient.

Figure 17. Showing One Way  
of Prepositioning an Auto-  
matic Screwdriver.



Prepositioning is of advantage largely because it reduces the time consumed in searching for the tool and bringing it into position for use.

### *Miscellaneous Principles of Motion Study*

In addition to the procedures just discussed for bringing about motion economy, a number of others have been proposed which need no elaboration.

1. The two hands should begin as well as complete their movements at the same instant.

2. The two hands should not be idle at the same instant.
3. Motions of the arms should be in opposite and symmetrical directions.
4. Momentum should be employed to assist the worker wherever possible, and it should be reduced to a minimum if it must be overcome by muscular effort.
5. The work should be arranged to permit easy and natural rhythm wherever possible.
6. The height of the work place and chair should be so arranged that alternate sitting and standing at work are easily possible.
7. The hands should be relieved of all work that can be performed more advantageously by the feet or other parts of the body.
8. Levers, crossbars, and hand wheels should be located in such positions that the operator can manipulate them with the least change in body position and with the greatest mechanical advantage.
9. All material and tools should be located within the normal grasping area.
10. Tools and material should be located so as to permit proper sequence of motions. The part required at the beginning of the cycle should be next to the point of release of the finished piece from the former cycle.
11. "Drop delivery" should be used for the finished product in such a manner that it can be disposed of without moving far from the point of completion.

## 5. CRITICISMS OF TIME AND MOTION STUDIES

Time and motion studies have been subjected to attacks from two directions. First, and perhaps loudest, have been the protestations from labor unions and similar organizations who maintain that such research (1) throws men out of work, (2) increases monotony, (3) raises the cost of management, (4) reduces the piece rate out of proportion to the increase in output, and (5) robs the worker of initiative and imagination. Each objection may be considered briefly:

1. Many men are sometimes temporarily unemployed because of technological advances. However, over an extended period of time vocational readjustments are made and the resulting state of affairs for all concerned is probably better than before the technological changes took place.
2. An increase in the number of repetitive jobs does not necessarily mean an increase in unpleasant monotony. People differ in their susceptibility to monotony. Some really prefer highly repetitive work to any other kind. For such people modern production methods are probably more interesting than the more varied activities of the craftsman era.
3. Management costs are increased by reason of the studies themselves and also because supervision is often stricter in order

to prevent workers from deviating from the prescribed actions. Nevertheless these costs are usually a minor percentage of the savings affected through increased output. The net result is a lower unit cost.

4. Piece rates are frequently reduced after a motion or time study simply because the production of a given unit no longer requires so much work or energy. Unfortunately, some rates have been reduced too much so that workers are unable to earn their former weekly gross wages even though they increase output. The chapter on Rewards for Work treats this problem in more detail.

5. In connection with the objection that initiative and imagination are thwarted, one must remember that earning one's living today is less time-consuming than a generation ago. Moreover, modern production methods are also characterized by less heavy drudgery. In other words, progressive management results in greater free time for the play of imagination and creative activity. Even while on the job, the habitual, automatic movements require little attention so that many workers report considerable day-dreaming and revery which may be turned to productive ends if the individual so desires.

The less publicized but perhaps more important criticisms of motion studies have come from psychologists and others among the time and motion experts themselves. These criticisms have been directed not so much at the effects that follow the application of the principles but rather at the underlying assumptions which Taylor and Gilbreth made at the outset of the movement. One basic assumption which pervades practically all time and motion literature is that for every operation there is a "one best way." The implication is that once this one best way is discovered, all workers can be taught the procedure and maximum efficiency will be attained. Such an assumption completely disregards a large section of psychological information showing the significance of individual differences. These differences must be recognized and adjustments to them must be made if work methods are to attain maximum efficiency. That is to say, time and motion studies in practice can only make recommendations that a particular series of motions be used. If, after a fair trial of these

recommendations, the worker reports increased expenditure of energy, or does not raise his output significantly, minor adjustments have to be made. The one best way may be all right for the one best workman, but where a number of workmen are engaged in essentially the same task, cognizance must be taken of their differing capacities, ages, anatomical structures, and even perhaps their prejudices.

A second criticism has been directed particularly at those American engineers who have taken either gross production figures or rate of output as measures of the effectiveness of motion studies. The human-energy costs and degree of satisfaction have been almost completely ignored. As the definition of efficiency at the beginning of this chapter indicates, the ultimate measure should be something more than a simple ratio of energy costs to output and is never determined by looking at output alone. In this connection it is significant that labor unions have generally opposed motion studies partly on the ground that they result in demands for excessive speed that may be injurious to health. The fact that this issue has been raised, irrespective of its truth or falsity, suggests that many times too much emphasis has been placed on raising output and not enough on decreasing energy input.

A third criticism attacks the assumption that the most efficient combination of movements can be determined by finding the least number and most efficient therbligs\* necessary for a complete cycle. These can be discovered, it is assumed, only by selecting one therblig from workman A, two more perhaps from worker B, another from C, and so on. This combination of movements is then accepted as the most efficient. Psychologists who give thought to this analysis protest that such fractionation and reconstruction of movements will not give the result desired. The nature of movements is in part determined by prior conditions. For example, the efficient therblig selected from worker A may be made possible by certain inefficient therbligs just preceding it in the cycle. To demand that workers execute only the best therbligs selected from a group of men is to insist on a cycle of movements that may be

\*A therblig is an elementary subdivision of a cycle of motions. Gilbreth, who coined the word, found that no more than eighteen such elementary motions were necessary to analyze all industrial operations. These eighteen therbligs are sometimes thought of as the "atoms" of motion study.



impossible, or may be considerably less than maximally efficient.<sup>8</sup>

In support of this latter contention is the growing body of experimental data suggested by Gestalt principles. These data indicate, for example, that a skilled act is best described as a fore-shortened, or telescoped combination of separate responses often fused to such an extent that the individual elements are no longer recognizable. Whatever else a skilled act is, it is certainly not merely one "correct" response hooked on, train fashion, to another correct response. Careful laboratory studies show, for instance, that in such tasks as writing and piano playing, the beginner makes a series of simple direct movements, each quite distinct. The skilled act of writing or piano playing is not characterized by such distinct acts but rather by a free flow of motion. The former "parts" of the act are now fused into a whole so completely that they are distinguished with extreme difficulty. The expert does not merely go through the same motions at a faster pace than the beginner. To assume the contrary is to raise expectations that the suggested order of therbligs—the one best way—can be immediately adopted by all cooperative workers. Whatever success has been attained by motion-study experts in combining therbligs taken from several workers probably has come about in spite of these basic assumptions and not because of them.

One must remember in the face of the above adverse comments that time- and motion-study engineers have made important and significant contributions to the science of work. Further developments along the same line may be expected even before the problems mentioned above are completely solved.

The principles suggested by Farmer to govern the conduct of time and motion studies are perhaps the most satisfactory and to some extent represent the attitude of the more progressive time- and motion-study investigators.

1. All time and motion study must be undertaken solely in the interests of lessened fatigue and never in the interests of increased production . . . .

2. The underlying principle of motion study is rhythm and not speed. We must look upon the best set of motions as the easiest and not the quickest . . . .

3. The proper use of time study is for the analysis of an operation in order to suggest lines of improvement, or to determine the relation between processes, rather than for standardization (that is, forcing all men to use the same motions).<sup>9</sup>

If the above principles are used as the basis of time and motion

studies criticisms of "speed-up," "making men into machines," "disregard for human personality" will be largely dissipated.

## 6. SUMMARY

This chapter has introduced the problems of production efficiency by considering the special contributions of time and motion studies. Particular attention has been drawn to some of the generalized suggestions which have found wide application in industry. Some of the outstanding criticisms of time and motion researches have been treated, particularly the notion that all operators should perform according to a standardized "one best way." The discussion of other factors affecting efficiency will be continued in the next chapter.

# Chapter 9

## EFFICIENCY IN PRODUCTION (*Continued*)

### 1. THE WORK CURVE

Efficiency in production may be brought about through an examination of factors other than those included under the time and motion studies discussed in the last chapter. Among these additional factors are the shape and height of the normal curve of work and the conditions affecting it. By the curve of work is meant that curve which represents the relation between rate of production or amount of work done per unit of time and the length of the work spell. The following figure is a representative work curve.

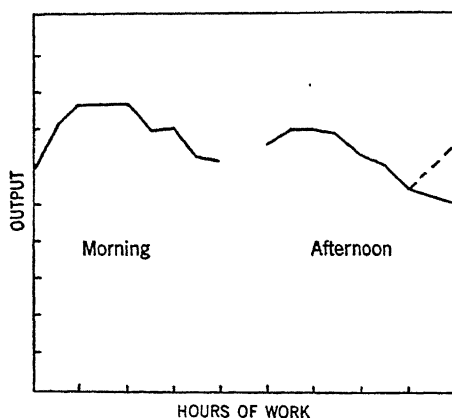


Figure 18. Showing Hypothetical Work Curve Typical of Many Tasks Broken Line Indicates End Spurt.

The work curve such as that shown above manifests three characteristics and sometimes a fourth. The initial rise in output early

in the work spell is the warming-up period when workers are getting under way, developing a "work attitude," and loosening their muscles just as a baseball pitcher warms up before taking over the mound. Next is the period of maximum production, maintained for periods that are largely determined by the energy of the worker and by the nature of the work. Last comes the tapering-off period, showing a rather steady decline in output until the end of the work spell. In some types of work, particularly those that are of a highly repetitive, simple type, an end spurt or short period of increasing output appears just before the spell is completed. Such an end spurt is indicated in the above figure by the broken line.

A word of caution about work curves is in order. Few daily output curves show all of the characters and relationships just mentioned. Special conditions peculiar to given job situations often distort the form of the curve from the rather "idealized" or abstracted picture given above. All work curves show some of the features just mentioned.

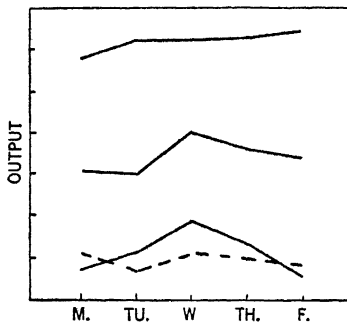


Figure 19. Showing Average Daily Output of Four Bottom Scourers. From C. S. Myers, *Industrial Psychology*, Jonathan Cape, Ltd., 1927, 59

The weekly curve of work shows much the same course with a high, but less than maximum output on Monday, reaching a peak usually on Tuesday and Wednesday, and gradually tapering off to a low point on Saturday.

## 2. FACTORS AFFECTING WORK CURVE

### *Length of Work Spell*

The length of the work period has a pronounced effect upon the rate of production. The best known investigation in this area was

completed during the First World War by Vernon, when he reported an increase in hourly output of 20 per cent for men sizing fuse bodies after the work week in a munitions plant had been shortened from 58.2 hours to 51.2 hours. A further reduction in the work week to 50.4 hours brought with it another 17 per cent increase in hourly output. In other words, a decrease in hours from 58.2 to 50.4 or less than 14 per cent, brought an increase in hourly output of about 37 per cent.<sup>1</sup> Similarly, Viteles<sup>2</sup> reports that the reduction of hours from 54 to 40 for speckers in the textile industry was accompanied by an hourly output increase sufficient to bring the total output slightly above the level of the 54-hour week.

These two studies are perhaps misleading in that they represent probably the maximal increases in output attributable to decreases in hours. An English source, basing its judgment on studies in the iron, steel, tin-plate, and glass industries, indicates that "within the limits observed the results are consistent in showing that a reduction in length of shift is generally followed by an increase in *hourly* output, but that this increase is usually insufficient to compensate for the shorter hours."<sup>3</sup> Moreover, even in those industries where total production is increased, a reduction in hours may be carried to the point of diminishing returns.

Work weeks of less than forty hours seem to be characterized by

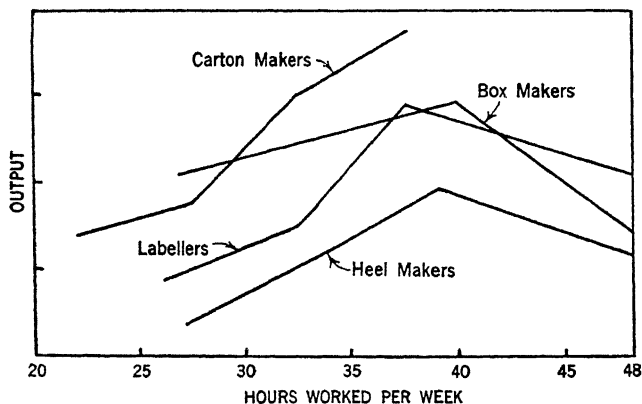


Figure 20. Showing the Effect of Length of Work Week on Hourly Output in Four Jobs. Adapted from H. M. Vernon and T. Bedford, Jr. *Nat. Instit. Indus. Psychol.*, 1925, 2, 157, and G. H. Miles and A. Angler, *Ibid.*, 300.

less than maximum production rates. The preceding figure incorporating data from two sources shows that hourly output decreases as the work week is either extended much beyond, or restricted to much less than forty hours.

What explanations can be proposed for these observations? With respect to the decrease in hourly output as hours are extended beyond forty, there is one rather widely accepted explanation. Workers seem to adopt unwittingly a "congenial" pace so that their feelings of fatigue at the end of the day are about the same, regardless of the length of the work period. On long days they save themselves for the grind; on shorter days they can afford to "let themselves out." This explanation finds support in the additional observation that the shorter workday or week is not immediately accompanied by a rise in output. Periods of two to twelve weeks may elapse when hours are shortened before a faster pace is evidenced in output records.

During the emergency of World War II it has been necessary to use the available man power to the best advantage for the greatest production. It became quite obvious that the optimum work week was not the same for all occupations. In an effort to obtain up-to-the-minute information on which to base recommendations in this regard and to convince management of the desirability of holding hours in line with the best production possible, a check list was distributed by the United States Department of Labor whereby adequate data on this point could be collected. The pamphlet said in part:

The most efficient hours schedule for sustained maximum production depends in part upon the type of work. The best hours can be determined by keeping certain records for each department or for operating units within departments . . . As hours in the plant are lengthened or reduced, the figures which will most quickly reflect changes in efficiency are figures of output and rejections or poor quality. Data on absenteeism, labor turnover, and accident frequency are also indicative. These figures if recorded over a period of weeks or months for certain departments or groups may show a trend. No one of these factors by itself is conclusive but a sudden or continuous upward trend by several of them should constitute a danger signal indicating that a point may have been reached at which long hours are adversely affecting production.<sup>4</sup>

The submaximum output for work weeks of twenty-five to thirty-five hours is attributed to either one or both of two factors. The first of these is a loss in skill that is supposed to take place between work spells. The second factor is the increased proportion of the warming-up period to the total work curve. Both of these take on added importance as hours are shortened and consequently may account for lower output.

### *Rest Pauses*

Increases in production have not only been achieved by adjusting the length of the workday to the workman but also by the judicious use of rest pauses distributed throughout the work spell. Taylor's early success with pig-iron handlers is a case in point. The problems pertaining to rest pauses are no longer concerned with whether or not they are effective in raising production, but rather in what kinds of work they are most effective and how long and how frequent they should be, to obtain their maximum effect.

A survey by the National Industrial Conference Board<sup>5</sup> indicated that rest periods were found especially advantageous in repetitive tasks demanding constant and close application. Other sources indicate that heavy manual work, as in Taylor's pig-iron handlers, also shows much improvement after rest pauses are introduced.

Some notion of the degree of improvement attributed to rest pauses can be obtained from a report by Mayo, who was consulted about excessive labor turnover and low production in a spinning department of a large textile mill.<sup>6</sup> At the time Mayo was first consulted the labor turnover was about 250 per cent per year as against 5 or 6 per cent in other departments of the mill. Using 100 as the time allowed for "standard" production, their best monthly production was in the neighborhood of 70. Rest pauses were introduced and went through several adjustments with respect to length, frequency, and the nature of activity permitted during the rest interval. Finally, four ten-minute periods were arranged throughout the day, during which the machines were stopped and the men instructed to lie down on sacking in the aisles near their posts. The first rest came after two hours of work; the second after another hour and a half. This left a concluding work period of one hour and

ten minutes for the morning. The same intervals were used in the afternoon. For the sixteen months studied after this program went into effect production jumped to an average of 83, the lowest monthly average being  $79\frac{1}{2}$  and the highest  $86\frac{1}{2}$ . Labor turnover also showed an improvement by dropping from 250 per cent to about 5 per cent.

The particular arrangements given in the above example are not to be looked upon as applicable to all work situations with the same success. No definite recommendations on these matters can be made other than that each work situation must be studied individually. In general, however, it has been found advisable to introduce rest pauses shortly after the daily production has reached its peak. The rest should be only long enough so that the accumulated deleterious effects of the previous work will be neutralized but not so long that "warming up" is again necessary.

The disposition of time during the rest pauses is far from standardized and varies from "cat napping" to organized calisthenics. Dancing, group singing, playing organized games, listening to educational lectures, eating refreshments, reading, or just loafing are some of the ways in which rest pauses have been spent in various establishments. The manner in which pauses are filled obviously depends upon the character of the preceding work. Sedentary workers generally profit from change of position and movement; those engaged in muscular work need opportunity to relax and rest.

Numerous studies as well as casual observations of many work situations indicate that employees frequently take unauthorized rests where no regular schedule of rest pauses exists. What advantage, then, has the regular schedule over the more informal system? To answer this question a group of comptometer operators were observed without their knowledge for a period of two weeks, during which a record was kept of the number and length of their unauthorized rests. (In this office such pauses were not prohibited but merely discouraged.) Later a system of regular pauses was introduced involving an eight-minute break in the morning and a seven-minute break in the afternoon. However, the length of the working day was increased fifteen minutes. This system reduced the unauthorized rests to about one-third their former length. The changed system moreover resulted in a 3.1 per cent increase in the



average time worked (clock hours minus authorized and unauthorized rests), and a 35 per cent increase in work completed.<sup>7</sup> In another instance where a similar change was made the actual working time was reduced 6 per cent with a consequent 3 per cent increase in volume of work and a 50 per cent reduction in errors.<sup>8</sup>

The reason for the advantage of authorized over unauthorized pauses can be found in two considerations. First, the "soldiering" may be done only after output has suffered a considerable decrement, at which time the rest will not have its maximum effect. In the second place, pauses which are surreptitiously taken while the foreman is down at the head office or engaged elsewhere are not conducive to complete rest or relaxation. The employee may be "on his toes," ready to get back at the job the moment the boss returns. Consequently, unauthorized rests are less effective than those sanctioned by the management because they may be improperly spaced and ineffectively used.

How can one account for the beneficial effects which rest pauses unquestionably exert on output records? What basic principles are tapped by the use of rest pauses? On these questions there is a division of opinion. Perhaps it would be more fair to say that certain factors seem to account for the success of rest pauses in given establishments while in other organizations other factors are responsible.

According to many, rest pauses achieve their effect on output largely because they provide an opportunity for recovery from incipient fatigue. According to this point of view the tapering-off period in the work curve represents the accumulative effects of the physiological wastes that normally are collected within the organism as a result of work. These residues of exercise in the form of lactic acid and carbon dioxide reduce the physical capacity for work. Consequently, rest pauses provide a period during which the body can recoup some of the physiological losses suffered during work.

A second explanation for the effectiveness of rest pauses is concerned with monotony. In the example cited from Mayo's experience above, he found evidence that the semiautomatic nature of the job engendered a feeling of boredom since the work required just enough attention to be irritating and not enough for complete absorption. Moreover, the operators regarded their work as "an indefinite and apparently interminable activity." Very shortly

after the introduction of rest pauses in this case the morbid pessimistic attitude of the workers improved considerably. Apparently the feelings of ennui were reduced, bringing about at the same time greater interest in the work which was reflected partly in increased output.

Still another factor may account for the effectiveness of rest pauses. The investigation of personnel relations at the Hawthorne plant of the Western Electric Company, described more fully in the next chapter, demonstrated that the introduction of rest pauses may change the attitude of the workers with regard to their supervisors. In this study a group of relay assemblers was selected as subjects for a long-term experiment designed to discover, among other things, the effect of rest pauses on output.

The girls came into the test with a somewhat suspicious and apprehensive attitude. At first they resented the periodic physical examinations. In Period IV they were worrying about how they would make up for the time they would lose when the two ten-minute rest pauses were introduced. When the introduction of these rests was accompanied by an immediate and definite rise in output, they began to worry about whether or not they would receive the increased earnings resulting from this rise. In other words, they were never sure that they were not going to be victimized in some fashion or other by the experiments or by the management. By period XIII (15-minute rest and lunch at 9:30 and a ten-minute rest at 2 30) however, this apprehension of authority was almost entirely dissipated. In this period the girls expressed full confidence toward those in charge of the experiment.<sup>9</sup>

The records show that the highest output occurred in period XIII in spite of the fact that in some of the previous experimental periods the rest periods were more frequent, or the workday was shorter. That the high output of period XIII is not entirely attributable to the particular timing or length of the rest pauses is demonstrated by the fact that period XII showed a very high output record when no rest pauses were permitted. Apparently, therefore, rest pauses achieved their effectiveness partly because their introduction was tangible evidence that management had a real interest in the welfare of employees. Relieved of tension and apprehension produced by notions about exploitation and unfair speed-up, the employees forged ahead.

### *Influence of Age*

Before the war expansion employers tended to avoid hiring men over forty. There was a common belief that older men, in spite of their more mature judgment and added experience, present greater industrial risks and are less efficient producers. A similar prejudice existed against people twenty years or younger, because of immaturity and lack of experience. Data collected by the United States Employment Service indicate that workers under twenty-one years of age constitute 18.1 per cent of the applicants and only 9.3 per cent of their placements. Much the same ratio of applicants to placements is presented of persons over fifty if the placements on public projects are discounted.<sup>10</sup> Employers apparently are reluctant to hire either young or old men.

Not many studies have been reported of the effect of age upon the curve of work. What little direct evidence is available indicates that somewhere between twenty and forty years of age most workers are most productive. The following figure gives the output of

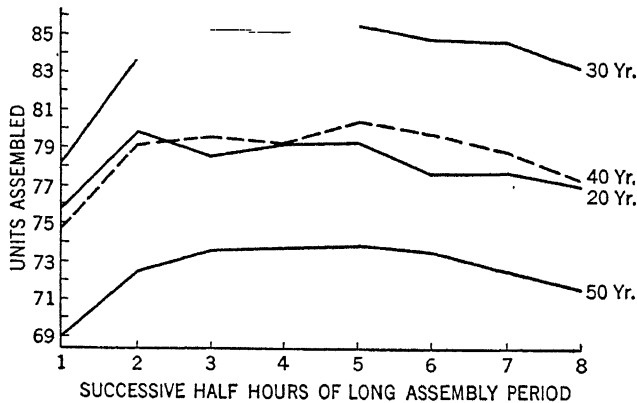


Figure 21. Showing Average Production on Nut and Bolt Assembly at Half Hour Intervals for Various Age Groups. From K. R. Smith, "Age and Performance on a Repetitive Manual Task," *Jr. Appl. Psychol.*, 1938, 22, 295-306.

men engaged in assembling bolts and nuts in a laboratory experiment that very closely simulated an industrial situation. Approximately forty men were included in each of the age groups indicated. It is perfectly clear that the maximum output was achieved by the thirty-year-old men and the lowest by those around fifty years of

age. To this extent the curves are in agreement with prevailing opinion, but further examination reveals an interesting fact. The curves are all of about the same shape. That is to say, even though the older men fail to turn out as much as the younger workers, they reach their maximum peak as quickly as the young men and maintain their level of production as consistently. This study certainly gives no support to the popular opinion that older employable men are more variable in output and are more easily tired than younger workers. Consequently, in those occupations where volume of output or speed of work is not particularly important, age need not be a serious barrier.

In Fig. 22 are data adapted from a number of tests conducted by

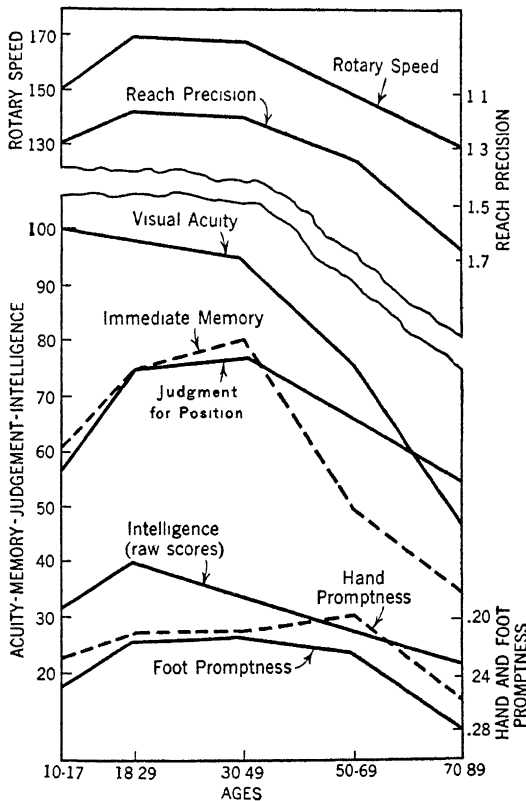


Figure 22. Showing Decline in Functions with Advancing Years. Adapted from W. R. Miles, "Abilities of Older Men," *Personnel Jr.*, 1933, 11, 352.

Miles. The curves represent raw scores with the exception of visual acuity which is in terms of per cent. Nearly all of the curves show a decrement beginning with the eighteen to twenty-nine age group, which is in general conformity with Smith's report cited above, as well as other related investigations.

### *Heating and Ventilation*

Researches within recent years have demonstrated that the problems of general heating and ventilation usually resolve themselves into a single problem: that of controlling the rate and mode of heat loss from the body surface so as to produce the most comfortable conditions where output is maximum. Notice that this statement does not include any reference to the chemical purity of the air. Only in those scattered industries where poisonous or astringent fumes from lacquers, or other highly volatile substances are present, is the chemical purity of air much of a consideration. Even here the problems can usually be solved by using local suction hoods to draw off the injurious materials. But the heating and ventilation of a large working area seldom requires attention to the amount of carbon dioxide exhaled or the amount of oxygen consumed by the workers present—this in spite of the fact that popular notions are current that the “stiffness” of the atmosphere is dependent upon the relative amount of “used” air.

Pure air normally contains 21 per cent oxygen and about 0.03 per cent carbon dioxide. The worst ventilated rooms contain about 20 per cent oxygen and about 0.5 per cent carbon dioxide. Contrast these percentages with the air in the lungs which normally runs 16 per cent oxygen and 5 per cent carbon dioxide. Consequently, the slight changes in these respects which take place in the air of closed spaces can have little if any influence on the body functions.

If, then, the efficiency of production and the comfort of workers depend upon the cooling power of the atmosphere, it is pertinent to ask what factors influence this cooling power. All recent work points to relative humidity (amount of moisture in the air), temperature, and air movement as important considerations in this connection. High temperatures, high humidity, and little or no movement of air decrease the rate of heat loss from the body surface and produce discomfort.

It is obvious why high temperatures should reduce the rate of heat loss, but how do humidity and movement of air influence heat loss? It must be remembered that the body is constantly perspiring. Under normal resting conditions the perspiration readily evaporates. The process of evaporation is in itself a cooling process, and its rate depends upon the relative humidity of the air. If humidity is high, evaporation of perspiration does not take place readily and the heat loss is reduced. Consequently, with moderate temperatures and high humidity one feels uncomfortable.

This process of evaporation can be accelerated by the movement of air over the skin. Thus, air containing a high percentage of water vapor is moved from immediate contact with the skin, bringing in its place less saturated air more capable of taking up the moisture. In one experiment conducted a number of years ago, six or seven students were shut within a sealed test chamber provided with an observation window. The oxygen fell to 16 or 17 per cent and carbon dioxide rose to 3 or 4 per cent; the temperature varied between 80 and 85 degrees and humidity averaged about 75 per cent. Little or no discomfort was experienced by the students so long as electric fans stirred this oppressive atmosphere. When the fans were shut off the students begged for relief.<sup>11</sup>

Having discussed the conditions that affect the rate of heat loss from the body, namely, temperature, movement of air, and humidity, consideration must be given the optimal combination of these factors that will result in maximum work with greatest comfort.

Laboratory studies in this area have revealed one rather surprising fact.<sup>12</sup> *Mental work*, such as arithmetic, color naming, giving opposites, and cancellation tests, is unaffected by adverse atmospheric conditions that produce considerable discomfort (86° F., no air circulation, 80 per cent humidity). It has also been reported that under good ventilation conditions (45 cubic feet of outside air per person per minute, 68° F., 50 per cent humidity) rate of improvement or learning is no faster than under the poorer conditions mentioned above. When subjects were free to work or not, temperature had no effect upon the quantity done between the limits of 68° F. and 75° F. At 86° F. the amount of work tended to drop off slightly.

The same studies indicate that *physical work* is markedly impaired by these same conditions. Increasing room temperature from 68° F. to 75° F. caused a decrease of 15 per cent in foot-pounds of work accomplished even when working under a cash incentive analogous to piece-work wages in industry. Similarly, a change from 68° F., 50 per cent humidity, to 86° F., 80 per cent humidity, produced a decrease of 28 per cent in work accomplished.

A suggestion that humidity control may be as important for some types of work as temperature control is found in a report showing that subjects were as capable in lifting weights at 104° F. as at 68° F., provided humidity remained about 50 per cent. However, the work at the higher temperature was executed at a higher physiological cost as shown by an increased rate of breathing and a longer time required for returning to normal after work.<sup>13</sup>

Studies of the effect of ventilation in various industrial operations give much the same picture as the laboratory investigations cited above. Forced ventilation of a gold mine reduced the wet-bulb temperature from 89° F. to 80° F. and brought about a production increase of 12 per cent. English investigators found the rate of production in a coal mine to vary directly with the "wet kata cooling power," a unit of measure which is a mathematical function of air velocity and wet-bulb thermometer reading. Their findings are summarized in the following table:<sup>14</sup>

Table 7. Efficiency in Coal Mining as Related to Atmospheric Conditions

<i>Mean Wet Kata Cooling Power</i>	<i>Rate of Production</i>
18.6	100
14.6	94
12.9	91
10.8	82
9.0	81
6.4	59

In tin-plate manufacture, output has been found to vary by as much as 20 to 30 per cent as between the coldest and hottest weeks of the year. This variation is smallest in well-ventilated mills and larger in mills where no special provision for ventilation is made.<sup>15</sup>

English experimenters placed a number of fans in a humid weaving shed, operating them on alternate days. Their data showed a

significant increase in production on those days when the air circulated.<sup>16</sup>

In spite of the rapid spread in the use of air-conditioning equipment, relatively few studies have been published showing the effects of such installations on output. There is little doubt that employees generally like air conditioning and may possibly work more energetically in such establishments. In 1932 the Philadelphia Electric Company air conditioned some of its district offices. Comparing figures over a six-year period, employees in the conditioned offices lost 28 per cent less time due to reported illnesses than those in the untreated offices. This difference may not reflect actual superiority of air conditioning from a health standpoint, but may rather indicate that some employees are indisposed to work in an uncomfortable office.<sup>17</sup>

These and a number of similar investigations leave no doubt that atmospheric conditions exert a definite influence on physical work. Muscular exertion produces more bodily heat than sedentary work. Consequently, provision for the ready dissipation of such heat is somewhat more imperative in factory, shops, and mines than in offices where less muscular work is done. Blanket recommendations for optimal atmospheric conditions cannot be made that will cover all occupations or industries. However, it is safe to conclude that most industrial operations can be performed in comfort between 67° F. and 74° F., with a relative humidity of not more than 55 per cent. If these conditions cannot be met because of operational requirements, as in blast furnaces, some degree of comfort can be achieved by circulating the air.

### *Oxygen Deficiency*

The tremendous increase in the importance of aviation in recent years has directed attention to the effects of high altitudes on human performance. It has been well established through a number of laboratory studies that the principal effects are due to oxygen lack rather than decreasing atmospheric pressure as such. The body builds up an "oxygen debt" because (*a*) the upper atmosphere contains less oxygen per cubic foot, and (*b*) the lowered pressure is insufficient to force what oxygen is available through the linings of the lungs into the blood stream.



No significant impairment of function is noticeable with flights up to about 10,000 feet. Beyond this height and up to about 22,000 feet profound alterations in performance and attitude may take place without the pilot being aware of any special difficulty. There is a loss in judgment, in emotional stability, in self-criticism, and in memory for recent events. Some become giddy and careless in making movements calling for fine coordination. An incident from one experiment will illustrate the effects often noted.

The handwriting of one subject was followed throughout a period of one hour while the oxygen was gradually depleted. At a simulated altitude of 22,000 feet (most of these studies take place on the ground in chambers where oxygen can be controlled and the subjects observed more easily than in an airplane), he appeared to be quite pleased with himself and became highly amused at the slightest provocation, in spite of temporary blanks in the visual field. At 25,000 feet (8.7 per cent oxygen) he began to omit letters from common words, and his writing became quite illegible. He complained of his feet feeling a long way off and of his inability to orient other parts of his body. At 28,000 feet (7.6 per cent oxygen) he was greatly incapacitated and yet he appeared to be cheerful and very pleased with his performance. He became quite annoyed when removed from the apparatus and insisted that he could go much higher. He was convinced of his marked deterioration only after seeing his handwriting.<sup>18</sup>

The implications of these and similar findings for military and civilian flying need no elaboration.

### *Illumination*

The effects of illumination on human efficiency have received considerable attention from industrial and electrical engineers, educators, physiologists, and psychologists. As indicated in the chapter on How to Study, the pressing problems with respect to illumination have changed from finding enough light to discovering the best kind of light. However, a survey of the effects of illumination on production necessitates attention to three aspects of lighting: (*a*) brightness or intensity; (*b*) quality, and (*c*) diffusion or distribution of illumination.

It is unfortunately true that in the presence of inexpensive and readily accessible sources of power, many establishments have

been inadequately illuminated. This has been partly due to ignorance on the part of management concerning the importance of light intensities above the level necessary for "just seeing." In the following table are summarized data showing the effect on production after raising illumination.

*Table 8. Examples of the Increase in Production Resulting from Increased Illumination\**

<i>Nature of Work</i>	<i>Average Foot-candles (Old System)</i>	<i>Average Foot-candles (New System)</i>	<i>Per Cent Increase in Production Obtained</i>	<i>Cost of Lighting in Per Cent of Payroll</i>
Pulley finishing	0.2	4.8	35.	5.
Soft metal bearings	4.6	12.7	15.	1.2
Heavy steel machining	3.	11.5	10.	1.2
Carburetor assembly	2.1	12.3	12.	0.9
Electric and gas iron manufacture	0.7	13.5	12.	2.5
Semiautomatic buffing shell-sockets	3.8	11.4	8.5	1.8
Letter sorting	3.6	8.0	4.4	0.6

The precise intensity of illumination for any given industrial task that is conducive to maximum efficiency will, of course, be determined by the nature of that task. Troland<sup>19</sup> concluded that the majority of industrial operations could be carried out at maximum efficiency in the neighborhood of ten foot-candles—a conclusion with which Tinker apparently agrees.<sup>20</sup> Other investigators seem to be inclined to recommend intensities somewhat higher. All, however, agree that in work requiring a high degree of fine discrimination, as in typesetting, drafting, sewing, watch-making, and the like, higher intensities are required.

Individual differences in "intensity tolerance" have been observed. Thus Ferree and Rand found subjects preferred different intensities for reading eight-point type as shown in the following figure.<sup>21</sup>

Provision can be made for such individual differences by providing, in addition to general illumination, local or spot illumination covering the immediate working space. The local lights attached to the working area can also be provided with intensity

\*From Luckiesh, M. and Moss, F. K., *The Science of Seeing*, D. Van Nostrand Co., Inc., New York, 1937, p. 277.

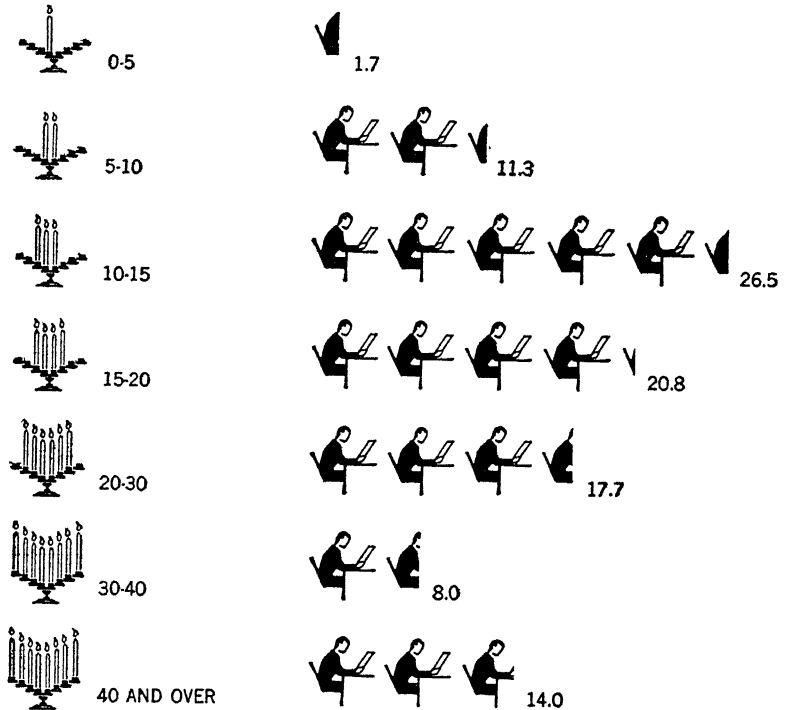
INTENSITY IN  
FOOTCANDLESPERCENTAGE OF SUBJECTS PREFERRED INTENSITY  
SHOWN AT LEFT

Figure 23 Showing Upper Limit of Light Intensity for Comfortable Reading.  
Adapted from C. E. Ferree and G. Rand, "Good Working Conditions for  
Eyes," *Personnel Jr*, 1936, 15, 333-340

controls so that the worker can select the amount of light which he prefers. The beneficial effects of local lighting as a supplement to general illumination in an office are graphically presented in the following figure.

A large publishing house employing fifty proofreaders solved the problem of individual preferences in intensity by first of all testing each for intensity preference and then placing them with respect to the windows so that each received approximately the amount of light required.

It has been known for a long time that refraction systems such as found in the human eye do not focus all wave frequencies of light at the same point or on the same plane. Red rays, for example,

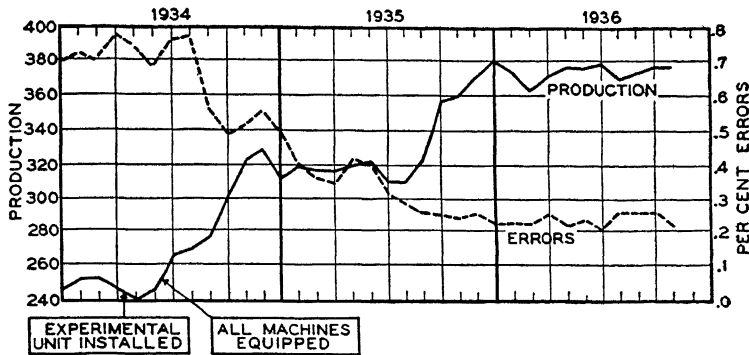


Figure 24. Showing the Effect of Equipment Machines with Supplementary Lighting Units. From M. Luckiesh and F. K. Moss, *Science of Seeing*. Courtesy of D. Van Nostrand Company, Inc., 1937, 275.

come to a focus at a greater distance from the lens than do blue rays. This inequality in the focal length of waves of different frequencies produces "chromatic aberration," or an inequality in the sharpness of focus of an image made up of rays differing in wave frequencies. Because of this fact it was assumed that monochromatic light (consisting of only one wave length) was the most satisfactory from the standpoint of human efficiency. Thus, mercury-vapor lamps giving mostly yellow and violet were installed in many establishments in preference to tungsten-filament lamps which give off a great variety of wave frequencies. Recent determinations have shown no significant superiority for mercury-vapor light over ordinary tungsten lamps when tested by visual acuity, and speed for performing a visual task.<sup>22</sup> On the other hand, mercury-vapor lamps produce no known disadvantages. Sodium-vapor lamps which have come into use within recent years, particularly for highway lighting, are truly monochromatic. Visual acuity is definitely improved under such light, especially where discriminations are required near the threshold. However, Luckiesh and Moss<sup>23</sup> found that the speed of seeing test objects considerably above the threshold under laboratory conditions was only 0.003 seconds faster with sodium light than with tungsten. They suggest that seeing large objects rather than minute ones is the more important factor in highway lighting and, therefore, the sodium light has little real advantage over tungsten. There is obviously a need for a thorough investigation of sodium illumina-

tion, not only under laboratory conditions but also at the level of daily use.

This discussion of light quality can be summarized very briefly. Colored light has little influence on those factors which are ordinarily involved in manufacturing or office work except where discriminations of size and shape are required in the neighborhood of the threshold values. In this latter case sodium-vapor illumination is somewhat superior, since speed of seeing is approximately 28 per cent faster than under tungsten, according to laboratory measurements. Direct studies of the effect of monochromatic illumination on production efficiency are notable by their absence.

By way of contrast to the work on light quality, considerable attention is being directed to the matter of the distribution of light, particularly with regard to the elimination of unwanted shadows and glare. In the vast majority of industrial operations it is desirable to eliminate great differences in illumination. As pointed out previously, marked contrasts in intensity set up competing and antagonistic reflex actions in the accommodatory and fixation mechanisms controlling the area of vision and the size of the pupil. It is, therefore, important if ocular fatigue is to be avoided that such antagonistic actions be eliminated as much as possible.

Numerous experiments have demonstrated the superior efficiency of semi-indirect or completely indirect lighting where the light source is effectively shaded or diffused. In one such experiment subjects were examined for visual acuity by looking at a test object consisting of a pair of vertical parallel bars printed in black on a white background. They were then asked to read either for two or three hours under one of the kinds of illumination being tested—brightness for all types being approximately equal. At the end of the reading period they were again tested for visual acuity. The criterion of acuity was the amount of time during a three-minute fixation period that the test figure was clear rather than blurred. Some decrease in acuity after reading was found, regardless of the type of illumination. However, as shown in figure 25, the least decrease occurred under daylight illumination and the next least under indirect lighting.

The chief objection to the use of indirect lighting is an economic

one. It costs more for the same intensity. In order to compensate partly for this disadvantage, Luckiesh and Moss have recommended that general indirect illumination be combined with direct illumination for restricted working areas requiring higher intensities. These local lights should be provided with opaque shades so that no direct rays may enter the eye of the worker.

The advantage which indirect illumination enjoys is partly attributed to the fact that the light is reflected from so many places—ceilings and walls—that sharp shadows are almost com-

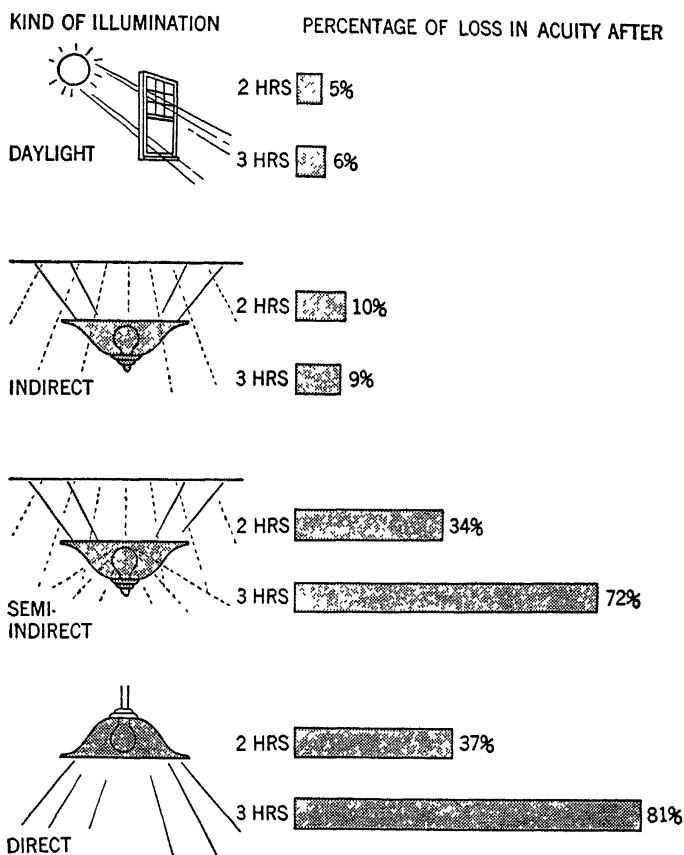


Figure 25. Showing the Effect on Visual Acuity after Reading under Different Types of Illumination. After C. E. Ferree as quoted by H. E. Burtt, *Psychology and Industrial Efficiency*, D. Appleton-Century Company, Inc., New York, 1929, 231.

pletely eliminated. Akin to the elimination of shadows is the problem of eliminating glare points or spots where a large amount of light is reflected. It frequently happens that glare is associated with direct light and highly polished surfaces, such as glossy paper, newly cut or turned metal fittings, and pavements. Generally speaking, glare can be eliminated or greatly reduced by the use of indirect lighting.

For the most part, glare, like sharp shadows, detracts from human efficiency. Not only does it produce subjective feelings of fatigue or distraction, but it may blind the worker to important aspects of his work. Inspectors of threaded brass fittings in one factory often missed small cracks in the work because the flaws happened to coincide with the glare points. Increasing the illumination would have only increased the glare. Indirect lighting, although more costly, was rated by the inspectors as more comfortable.<sup>24</sup> The use of polaroid spectacles can sometimes be used in reducing glare and at least one soap manufacturer equipped inspectors with these spectacles to raise their efficiency. At present no direct satisfactory evidence is available showing the effectiveness of polaroid in raising production efficiency.

The discussion of the effects of illumination on human efficiency has shown that two aspects of lighting are important: intensity and distribution. The third factor, color, has little or no demonstrated effect on those functions normally used in industrial operations. The optimal intensity for a given operation will depend upon two factors: the nature of the work and the individual's preferences. Probably most industrial work can be efficiently performed within the limits of five to twenty-five foot candles, if the work area is free from marked shadows and light is distributed so as to reduce glare to a minimum. Special lighting requirements are demanded by tasks that involve high visual acuity.

### *Noise*

Few adverse factors in twentieth-century civilization have come in for such whole-hearted attack as noise. Various noise-abatement commissions have railed against it and many progressive industrial managers have gone to considerable trouble and expense to reduce harsh loud noises to muffled murmurs. In view of this

widespread attack it is rather surprising to discover a relative paucity of clear scientific evidence showing important deleterious effects. By this is not meant that noise is without its disadvantages; but the disadvantages seem to be far outweighed by the vigor with which acoustical engineers, architects, and the like track down and smother creaks, clicks, and clangs.

One of the earliest and best known laboratory experiments required subjects to depress appropriate keys on the exposure of numbers or letters. Work was done under quiet as well as noisy conditions produced by gongs, buzzers, bells, and phonograph records. The subjects were merely instructed to react as quickly as possible. Unknown to them the pressure with which they pressed the keys was recorded. The results show that after a brief period of retardation in speed when noise was introduced they tended to work faster than under quieter conditions. The records of pressure exerted in striking the keys showed a marked increase for all subjects at the moment noise was introduced. In other words, while the distractions had a slight beneficial effect upon output they also materially increased input.<sup>25</sup>

Much the same sort of result was obtained when typists worked under noisy conditions in an ordinary untreated room as compared with work in the same room after being lined with sound-absorbing material. In this case, the typists wrote the same letter over and over again in order to eliminate possible differences in the difficulty of typing and also to reduce practice effects to a minimum as the study proceeded. All the typists wore a kind of gas mask so that the exhaled air could be collected and analyzed for CO<sub>2</sub> content—a measure of metabolic rate. Like the previous study, the quieter conditions had a slight influence on speed and accuracy of work. This time, however, the average increase in speed for all subjects was about 3 per cent under the quieter conditions. The most striking difference appeared in the metabolic rate while working, which was 19 per cent greater when the room was unlined with the sound-absorbing material. Again it is found that output is affected only slightly by the excess noise but input changes significantly.<sup>26</sup>

Field studies of the effects of noise reduction give a somewhat different picture. In these cases it is usually impossible to get any



measure of input because the necessary apparatus and requirements would seriously interfere with office or production routine. Consequently, such studies are compelled to evaluate noise reduction in terms of output only.

The noise level of an insurance office was reduced from forty-five decibels (a decibel is approximately defined as a just noticeable difference in sound intensity) to thirty-five decibels. Although no other changes were made in the office, output increased 12 per cent. Moving the assembly department of a temperature-regulator company from next to the boiler room to a quieter location reduced faulty assemblies from 75 per cent to 7 per cent of those turned in for inspection. At the same time, output increased from 80 to 110 per unit of time. Lowering the noise level in a telephone-exchange room from fifty decibels to thirty-five decibels resulted in a 42 per cent reduction in errors and a 3 per cent reduction in the cost per message.<sup>27</sup> Some have suggested that since these field studies are somewhat at variance with the laboratory investigations the reported increases in output are not attributable to noise reduction itself but rather to a changed attitude on the part of the workers. It was pointed out in connection with the discussion of rest pauses that a more favorable attitude toward supervisors and the company in general, resulting from the introduction of rest pauses, may be the basic reason for output increases. The same factor may be operating in the case of noise reduction. Workers may feel that in spending money for noise-absorbing materials, "noiseless" typewriters, and the like, the management is taking a real humanitarian interest in their welfare. This changed outlook, which of course is not a factor in the laboratory experiments, may account for increases in output in the field studies.

The findings of another laboratory study suggest that over a period of several days an individual may adjust to excessive noise even though the initial effects may be deleterious to efficiency. In this experiment subjects were required to add a long series of three-place numbers. A number of physiological measures were taken simultaneously during the work period, including heart rate, metabolism, breathing rate, and breathing volume. The noise was provided by means of phonographic records of actual office and street sounds ranging from fifty-five to sixty-five decibels. Under

the noisy conditions the physiological measures at first showed an increase in energy expended, in some instances as much as 60 per cent. At the same time, some slight decrease in accuracy and number of problems solved per unit of time were noted. After a period of several weeks during which the subjects worked only twenty minutes per day, the effect of the noise gradually disappeared and nearly all measures were back to the values obtained under quiet conditions.<sup>28</sup>

It must be remembered that not all noise intensities are disadvantageous to working efficiency. There is some evidence suggesting that reduction of the noise level below thirty-five decibels exerts such a slight effect on production as to be worthless. On the contrary, a general hum of low intensity may be more conducive to high efficiency than a completely "dead" room devoid of all extraneous noise (see chapter on How to Study). Moreover, it is generally agreed that intermittent sounds that stand out from the general hum are detrimental to efficiency even though their intensities may be quite low.

Noise in industry, therefore, is not to be condemned completely. The bulk of evidence seems to indicate that moderately high intensities have a slight direct effect upon accuracy and output but a rather marked influence on the expenditure of energy, at least before adjustment to the noise is complete. In other words, under such conditions the energy cost per unit of output is higher than necessary. The discrepancies between laboratory and field findings in respect to output may be attributed in part to the development of a more favorable attitude on the part of workers when working areas are acoustically treated.

### *Repetitive Tasks*

The development of mass production in present-day industry has been accomplished largely by fractionating work into smaller and simpler units. Such fractionation permits workmen to become very highly specialized in the sense that they are able to complete their assigned jobs with great speed and little effort. At the same time, simple tasks of a highly repetitive nature are conducive to feelings of monotony and a disinclination to work. Consequently, there is a possibility of carrying the fractionation of work too far. Instead

of a gain in efficiency there may be a loss. The following discussion will attempt to reveal the manner in which monotony affects the work curve and ways in which those effects may be reduced to a minimum.

In operations where workers report considerable boredom there are frequently found two types of deviations from the typical work curve. The first is great variability in production from hour to hour. The initial warming-up period may be obliterated by an almost precipitous decline. The period of maximum output may be at any point during the work spell. Moreover, the curves show no consistent trend from day to day. The second rather common feature of "monotony curves" is the end spurt. Apparently, as the end of the period of work approaches, the bored operator, perhaps realizing that his previous work has been unsatisfactory, puts forth extra compensating effort.

### *Proper Selection*

How can the effects of monotony be reduced? Efforts toward this end have been of two kinds: the proper selection of workers and adjustments in the work. In the first place, one of the early discoveries in this area was that repetitive tasks do not engender the same degree of monotony in all persons. Munsterberg reported the very interesting case of a girl employed to wrap electric-light bulbs with tissue paper. The task merely required that she grasp the bulb in one hand, the paper in the other, twist the paper around the bulb and place the wrapped bulb in a carton. She was able to pack twenty-five bulbs in forty-two to forty-four seconds. In the twelve years of employment at this task she had wrapped about fifty million bulbs. Certainly here was a highly repetitive task that appeared to be extremely monotonous. But to this particular woman it was pleasant and interesting. She noted the different ways in which she grasped either the paper or the bulb; the ease or difficulty with which the packing progressed; the number of cartons completed in a given interval. The repetitive work was not monotonous. Other instances may be cited where a task calling for varied activities may be monotonous, as, for example, the grammar school teacher who is bored with her work, or the department-store clerk who is "fed up" with his job.

One way, therefore, of reducing monotony in industry is to select people who will not be bored with the jobs to which they are assigned. As a first step on this program, some investigators have attempted to find the characteristics which mark people susceptible to monotony, particularly in repetitive situations.

A number of studies show that persons of low normal intelligence are less likely to be bored by repetitive work. In Fig. 26 is a

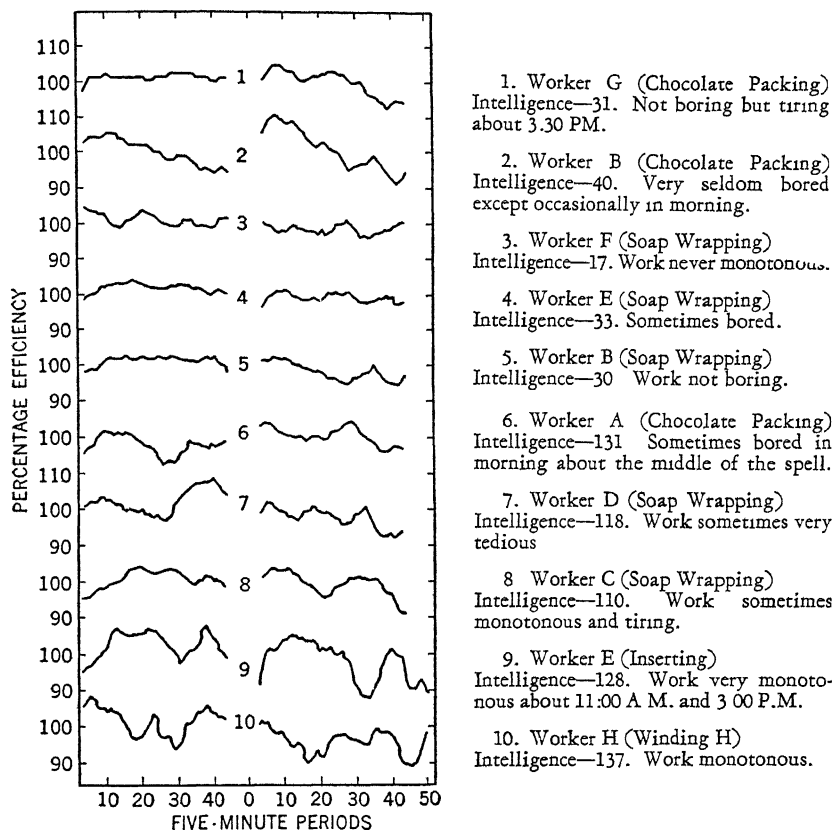


Figure 26. Showing relation of intelligence to boredom. Curves indicate output of ten workers. Cases 1 to 5 are representative of workers inferior in intelligence; 6 to 10 are workers of superior intelligence. The more intelligent workers reported greater boredom and showed greater irregularity in output.<sup>29</sup>

comparison of individual work curves, intelligence, and introspective reports of boredom. Examination of the figure shows that curves 1 to 5 are for persons with raw scores on an intelligence test

of less than 40, while curves 6 to 10 are for persons with scores above 110. Not only are the curves in the second group more variable but in confirmation of what was said previously about the effect of monotony on the form of the work curve, it will be noted that even those curves in the first group which show wide excursions are for persons reporting some boredom.

In addition to intelligence, other personality characteristics are associated with monotony susceptibility. A study of 355 women doing repetitive work in a chemical factory revealed that those experiencing most boredom tended to be more extroverted rather than introverted; desired creative rather than routine work, attached more importance to promotions; desired opportunities to use their own ideas and work which made them think.<sup>30</sup>

Only a beginning has been made in devising tests other than intelligence tests that will predict monotony susceptibility. One such attempt,<sup>31</sup> however, included a questionnaire giving a rating of emotional stability supplemented by performance on a punch board, a digit-cancellation test, an intelligence test, a crank-turning test, and a simple maze. The scores on the emotional-stability questionnaire, punch board, cancellation, and intelligence tests were found to yield a correlation of .71 with susceptibility to monotony when they were combined and properly weighted. In interpreting these findings one must remember that the study was made entirely in the laboratory, employing college students as subjects. Susceptibility to monotony, moreover, was determined by treating production curves on a high repetitive laboratory task and not in terms of subjective feelings. In spite of these limitations, the study is indicative of what may be done in the way of devising tests for predicting monotony in repetitive tasks. Apparently no attempt has been made to discover the personality characteristics associated with feelings of boredom in jobs of more varied nature, as in clerking, school-teaching, bus-driving, and the like.

### *Making Work Less Boring*

In addition to selecting persons relatively unsusceptible to monotony for repetitive work, various suggestions have been made to reduce boredom by altering the task or improving working conditions. Many of these suggestions spring from the assump-

tion that boredom is associated with an unfavorable attitude or mental set toward the job at hand. The bored worker may think of his work as unimportant, interminable, uninteresting, barren of any satisfaction of accomplishment. With this idea as a basis for attack, solution to the problem of monotony becomes quite obvious. Educate the worker in the importance of his work; engender a feeling of pride in belonging to a progressive, modern organization that outsells, outproduces, its competitors and "plays square" with employees. Even in highly fractionated, repetitive work some satisfaction in accomplishment can be provided by minor alterations. Thus in an English jam factory workers were given large trays of fruit to be sorted. Many spent a full day on a single tray; a few finished two trays a day. By simply giving each sorter only half a tray at a time production for many was doubled. The investigators suggest that part of the improvement was due to numerous small end spurts as each tray was nearly completed. Undoubtedly, the workers derived additional satisfaction from the mere fact that they no longer looked upon their work as a long, unending process. The work was split into a series of rather self-contained units, completion of each unit giving some satisfaction.

### *Shifting Jobs*

It has been suggested that workers be permitted to shift from one task to another, as a means of alleviating monotony. Not only does such a practice run counter to the evolution of industrial specialization but, moreover, is open to managerial difficulties. In one large automobile-assembly plant the practice was permitted to a limited extent for a time and later discontinued because the men themselves preferred to remain at their regular posts. (Further discussion of this practice will be found in the chapter on Rewards for Work.) The laboratory and field studies on the effectiveness of shifting from one job to another show considerable disagreement in their conclusions. In general the effectiveness of such a policy depends at least in part on the degree of similarity between the jobs, and the frequency with which the shifts are made. If the jobs are so similar that they approach identity or so dissimilar that they require great versatility in skill, shifting will probably be less efficient than if the jobs differ to a moderate degree. Like-

wise, if jobs are alternated frequently during the workday, confusion in operations may result. On the other hand, if the frequency of change is only once or twice a month the effect on monotony will be reduced and a longer period of adjustment will be required each time the change is made. Somewhere between these extremes lies the optimal frequency of change. Generally speaking, industry has not found the policy of changing jobs in order to reduce monotony a satisfactory one. However, where stabilization of employment is the aim, the policy has some merit as shown in the chapter following.

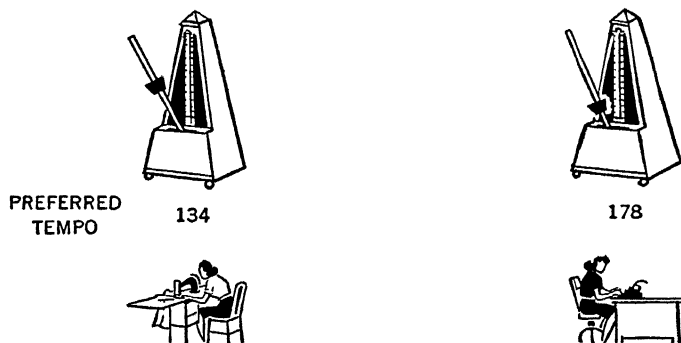
### *Music and Rhythm*

Industry, particularly during the war boom, has taken to music as a means of increasing production and reducing boredom. Even without the backing of a number of well-controlled experiments showing the advantages of musical rhythms a considerable body of random observations would encourage the present widespread use of musical accompaniments to work. Traditionally, sailors have worked to the swing of a song and a good chanteyman is reputed to have been worth four times an ordinary seaman. Gangs of workers from the Nile to the Mississippi have lightened and speeded their labors by the rhythm of a tune. In some cases modern industry has accidentally discovered the value of music as did the Newark plant of Westinghouse Electric. Here recorded music was originally played as a means of testing equipment in the early days of radio. Requests by the workers led to installing public-address systems throughout the plant so that the music could be enjoyed by all at regular intervals but especially during overtime periods.

One important practical question is the determination of the optimal rhythms conducive to work. Humes investigated the effect of slow, fast, and "arranged" musical programs on the production errors (scrappage) of vacuum-tube assemblers. The "arranged" programs were those in which there was approximately an equal number of slow and fast tempos. It was planned to gather scrappage data for a period of three weeks at the end of the other experimental periods during which no music would be played. An employee petition, however, caused the management to restart the

music after a little more than two weeks of "silence." In spite of this interruption in the plans the data showed generally less scrappage during the six weeks in which the daily programs were either all slow or all fast tempos. When fast and slow tempos are alternated scrappage tended to increase, although not always.<sup>32</sup> It appears that music similar in tempo sets a pace for the day or week which ought not be disturbed if high output is desired. It is probably unwise to generalize from this study that any consistent tempo of music is satisfactory for a given industrial operation. Each industrial operation might be examined individually to discover the tempos best suited.

One study of tempo preferences revealed some significant differences between persons in different occupational groups. A metronome, adjustable to speeds of 40 to 208 beats per minute, was set up in such a way that subjects could indicate the speeds they preferred. The figure following indicates that commercial typists prefer much



*Figure 27. Showing Auditory Tempo Preferences as Related to Occupations.*

faster speeds (more beats per second) than dressmakers.<sup>33</sup> The constant emphasis on speed in the former group may account for their preference, but on the other hand those who prior to training prefer fast speeds may elect typing partly because of this liking for fast action. In any case, the nature of the work must be considered and analyzed before recommendations as to tempo of music can be made. The same study showed that power-machine operators on the average preferred a tempo of 161; beauty culturists, 139; and domestics, 140.

There are other effects than increased production from rhyth-



mical work. A great many workers will agree with the instrument maker who declared, "Music acts like a tonic when you feel yourself getting tired." Probably part of the fatigue relief comes from diverting attention from oneself to the tune. In addition, rhythmical work, even in the absence of external stimuli pacing it, takes on the characteristics of ballistic actions which, as previously seen, are more effortless. In rhythmical actions the motions are set and the momentum keeps them going.

## 7. SUMMARY

The present chapter has been concerned with the conditions that influence the height and shape of the work curve. Chief among these considerations are the length of the work spell, the spacing and length of rest pauses, the age of workers, atmospheric conditions, illumination, noise, repetitive nature of the task, the presence of musical accompaniments or other ways of introducing rhythm in work. For the most part, these factors have been evaluated in terms of their influence on output alone. Very few investigations have been concerned with the other equally important aspect of efficiency, namely, input and the resultant worker satisfactions. This bias in the existing studies comes from the difficulties in measuring the energy expended and the satisfactions derived. In a number of places the evidence suggests the hypothesis that within limits, increments in production are due more especially to changed attitudes on the part of employees rather than the altered physical conditions of employment. The next chapter will deal at greater length with attitudes and morale as they influence production.

# Chapter 10

## MORALE AND REWARDS FOR WORK

The morale and consequently the efficiency of any modern industrial enterprise is in no small degree determined by the incentives provided for superior work. Basically, men work for some reward. The monetary, social, or intrinsic value placed upon that reward is an ever-present consideration to all members of an organization, from the general manager down to the lowest supply boy or janitor. What men want, what they expect, and what they get in exchange for their efforts contribute mightily to industrial peace and discord. It will be the purpose in this chapter to examine some of the principal kinds of rewards in industry and point out the relative success with which some of them operate.

### 1. FINANCIAL REWARDS—WAGES

#### *Piecework vs. Day Work*

Wages, the most widely exploited financial reward, are paid according to two basic systems. Workmen are paid either for the time they put in or for the production they turn out, or some combination of the two. The former has historical precedent and is usually referred to as a "day wage." Piecework wages are of more recent origin and were evolved largely to endow wages with greater incentive potency than could be obtained with a straight wage based only upon time spent within the factory gates.

The shift from day to piece rates has been most marked among "production" workers as contrasted with draftsmen, clerks, typists, bookkeepers, toolmakers, "supply" and maintenance men. The latter are generally paid day wages although in some concerns modified piece rates also apply to them. The principal limiting

factor seems to be the ease with which piece-rate systems can be applied to the tasks involved. Sales and production work are of such a nature that the systems can be readily adapted.

The basic reasoning underlying the piece-rate system of wages can be stated somewhat as follows: Day wages provide no incentive for extra effort. If conditions are arranged so that the employee is rewarded directly according to his effort or ingenuity, he will extend himself consistent with his capacities to gain extra rewards. This has been the logic of management.

From the standpoint of broad general efficiency such a shift from day to piece wages is unquestionably desirable. When a skilled, intelligent, and ingenious workman is not encouraged to produce higher quality or greater quantity than the mediocre worker, there is an unnecessary waste of human powers. Such conditions often exist under a straight day wage because the superior man is paid exactly the same as the average and no lure is held in front of him for which he must extend himself. But where units of production, number of sales, or some other index of completed work is directly related to a man's wage he may be motivated to do more than is necessary merely to hold a job.

The change from day wages to simple piecework wages has not solved the problems of industrial motivation with the ease that many of the early proponents of the newer incentive plans envisioned. New problems associated with wage administration have been introduced, robbing straight piecework wages of a part of their motivational value. The first of these problems centers around the question, what shall be the rate per piece? Day wages are frequently set by custom, the average wage paid for a given type of work in a given community. In the case of piece rates custom cannot be the criterion. Frequent changes in design, nature of operations, and even the creation of new specialized tasks in modern industry follow each other with such rapidity that customs have no time to establish themselves. The only apparent solution lies in the application of scientific time studies to determine the number of pieces that could be produced in a day. With this information a piece rate can be set which will assure even the slow workers at least a subsistence wage.\*

\*A subsistence wage will provide the bare necessities for the employee and his family.

The solution runs into difficulties where employees fail to cooperate with the time-study engineers. Numerous devices are employed to lengthen the operation times while under examination. Belts are shifted to retard machine speeds. Lathe operators set their cutting tools so that they will not take a large "bite." In one case a compressed-air valve was opened by a section "look-out" as a signal to slow down work each time a time-study man appeared on the floor. Men who have devised special tools of their own to facilitate work hide them before being timed. All of these dodges are employed in an effort to obtain a high rate of pay.

A second difficulty has been introduced on the heels of the first. Once a high rate has been set on a given job, the workers fail to extend themselves or work to their maximum speed for fear that the management will think their weekly gross wage too high and then reduce the rate. Consequently, production has not been stimulated but has been drastically retarded in numerous cases. In one automobile plant the heat-treat gang, for fear their rate would be cut, decided that 85 cents an hour was all they wanted to average. For two years none of them made more than this, although the inspector found at least one worker who could earn more than \$2.00 an hour. The net result from the introduction of piece rates, therefore, has not been much different from day rates. Certainly, in a great many instances piece-rate wages operate in such a manner as to defeat the ends which are their *raison d'être*.

Moreover, piece rates, even when carefully administered, are productive of anxiety. The piece worker is under pressure for production and is, therefore, not certain that he will earn his normal day's wages. His earnings, moreover, depend upon a number of factors beyond his control: the volume of available work and the efficient routing of supplies and materials, among other things. Piece-rate systems force the workers to be risk-takers to a larger extent than time-payment systems. It is a role that most workers dislike and few can afford, since they live too close to the subsistence level.

In order to meet various of the principal objections to piece-work wages and at the same time retain what appear to be their inherent advantages, various hybrid species of wage systems have developed. Two such representative plans follow.

*Taylor Differential Piece-rate Plan*

Taylor proposed that a given piece rate be established for "sub-standard" production and a second but higher rate be paid for above standard production. Substandard production was defined as a given number of units per day as determined by time studies.

The theory behind the plan was that men would be motivated to reach the production level where the higher piece rate started. That is to say, suppose the time studies define fifty units as standard production per man per day. A piece rate of 8 cents a unit might be established for the first fifty units, and 12 cents for all units over fifty. It was thought the worker would thereby be induced to produce at his maximum in order to reach the higher rate. Moreover, persons who could equal or exceed the standard production (sometimes called by the men the "bogey") would be attracted to the work, while those who could not get beyond the bogey would become discouraged by their low earnings and seek employment elsewhere.

In practice the substandard rate was set so that the bogey had to be exceeded if a man were to receive a subsistence wage. The above-standard rate, on the other hand, was usually markedly higher than the average for the trade or occupation. Thus the conscientious, industrious employee was rewarded in proportion to his energy and skill.

The principal objection to the plan lies in the fact that if it is to achieve its end the time studies must be made with an extreme accuracy that is seldom attained, and the bogey must be high enough so that it cannot be easily surpassed. The latter requirement is usually so severe that only the very superior employees can meet it consistently. For the vast majority of the workers the plan means uncertain wages, contributing to economic and mental insecurity.

*The Bedeaux Point System*

This system is based on the notion that management and the worker are both entitled to a share of the benefits that come from fast production. Management should have a share because of installing laborsaving devices and other services which contribute to the health and well-being of the workers. The men, apart from the incentive aspect of wages, of course, have a claim against the bene-

fits of their faster production because of the additional energy required.

The whole system rests upon the determination of a "bedeaux," the amount of useful work completed by a workman in one minute at his normal speed. Allowances are made for rest periods and delay. A bedeaux or point standard is set by the time studies for a given job. Assuming that a given task has a standard of three points per unit completed, if a man turns out two hundred units in an eight-hour day with four six-minute rest periods, his point-hour rating is computed:

$$\frac{(200 \times 3) + (4 \times 6)}{8} = 78 \text{ points per hour.}$$

Now, by definition, sixty points per hour is equal to a standard production. That is to say, the hourly bogey is sixty points. (In terms of units of production in this case, the bogey is twenty.) This man has exceeded the hourly standard by 18 points per hour or 144 in 8 hours. If the base rate is 40 cents per hour, his base wage is  $8 \times \$0.40$  or \$3.20 per day. His excess production is rewarded by converting a percentage (usually 75 per cent) of his excess points into time by dividing by sixty and multiplying by the base rate:

$$\frac{144 \times .75}{60} = 1.8 \text{ hours} \times \$0.40 = \$0.72.$$

Thus the man's gross for the day is \$3.20 plus \$0.72. In other words, this man is paid for 9.8 hours of work even though he spent only 8 clock hours on the job. On the other hand, he has completed work which a man operating at the standard speed would require 10.4 hours to do. It is clear that both management and the worker benefit by the system. Moreover, the basic objective of an incentive wage system is retained, namely, the worker is rewarded directly for his extra effort.

The chief objection to this system is the difficulty many workers experience in understanding the method of computing wages. It must be remembered that any factor which tends to create suspicion between labor and management is a potential source of open conflict, particularly when wages are involved. A wage system so

complicated that the workers cannot determine in advance their weekly earnings carries a heavy handicap.

From the administrative standpoint the system is expensive to install and must be revised at considerable cost each time a change in design or operations occurs. In those industries where the operations are reasonably stable this objection is of little importance.

These two plans exemplify the complications into which the piece-rate type of wage system has developed. Two features are common to all such plans: (*a*) A base wage is usually guaranteed on an hourly basis for rest periods, substandard quality, unavoidable delays or breakdowns chargeable to the management. This wage is ordinarily equal to, or somewhat less than the subsistence wage. (*b*) An incentive wage or premium is provided that depends upon the amount of work turned out. The premium is added to the guaranteed wage when the pay rolls are made up.

A survey of more than twenty such wage systems in actual operation revealed production levels and average earnings have been increased by their use. Costs per unit have decreased.<sup>1</sup> In other words, incentive wage plans have tended to increase the efficiency of production, especially when management has dissipated workers' fears of losing good rates by strictly adhering to a guarantee that rates will remain unchanged until there is an alteration in design or operations.

## 2. FINANCIAL REWARDS—MISCELLANEOUS

In addition to the wage systems just discussed, other financial inducements have been supplied workers, notably stock-purchase plans, profit sharing, and bonuses.

### *Stock-purchase Plans*

Within the past twenty-five years interest has developed in plans designed to encourage the employee to invest in the stock of his employing concern. The assumptions and aims of this interest can be very simply stated. If the workman is also part owner it is assumed he will be interested not only in receiving high wages, but also high dividends, which means further that he will be interested in aiding management to operate efficiently and with a minimum of waste. Consequently a working force which has a stake in the

business is working in favor of its self-interest whenever it aids management. Labor difficulties should be minimized thereby, since extreme unjustified demands on the part of the workers will only result in limiting their own dividends.

Various sociological arguments have been advanced in favor of such plans. First, employees who are in daily contact with the business are obviously better informed and more acutely concerned with its welfare than absentee stockholders who judge the enterprise only by the size of the dividend check. For this reason the employee stockholder is in a position to exercise his prerogatives as part owner with greater wisdom. Second, if the worker has an appreciable income from investments his economic position is more secure in times of temporary recessions. The critical reader may find exceptions to these supposed advantages. For the moment the exceptions may be ignored.

The practical difficulties into which the stock purchase plans have fallen have discouraged their extension much beyond those concerns which possessed such plans in 1929. The reason is not hard to discover. A common feature of practically all employee stock-purchase programs has been installment payments. On a rising or even a stable stock market, installment payments run into few difficulties. However, great injustices develop when the market is bearish. Employees of one large bank found themselves still paying for stock subscribed to at \$200 per share when the market price was \$14.

The principal psychological objection to employee stock-purchase plans lies in the remoteness and comparative insignificance of such benefits that may come to the worker. Ordinarily a given worker owns a very few shares, the annual dividends from which are only a minor part of his total income. Moreover, the size of his dividend is very frequently unrelated, even remotely, to his own aggressiveness, perseverance, or efficiency because of two factors: (*a*) the production end of a large enterprise is only one of a number of factors that may determine the net profit; (*b*) within the production or manufacturing division a given employee stockholder ordinarily exerts little effect on the total efficiency of his division. Thus, an inexperienced worker may damage machinery or retard output to such extent that department efficiency is seriously



impaired, in spite of the good work of the employee stockholder. Or again, the purchasing agent may make a poor deal in a given fiscal period which may cancel whatever profit the manufacturing division has built up by reason of the workers' extra efforts. Consequently, stock ownership usually fails to provide any immediate and direct reward for the worker's superior quality or quantity of production.

### *Bonuses and Profit Sharing*

The only distinction between bonuses and profit sharing seems to be that in the former, cash disbursements are made unsystematically whenever the management has sufficient reserves and is so inclined, while profit-sharing schemes involve a previous announcement that disbursements of a given percentage of the profits will be made at stated intervals to employees of a given rank.

The aim of both procedures is to generate loyalty and good will among the workers. Some firms have found in such schemes good publicity that cultivated the good will of their customers. Others have reported some increase in economy of materials and machinery resulting from these plans.

Generally speaking, there is little to recommend either of these financial rewards from a psychological standpoint. They are open to the same criticism that applied to employee stock-purchase programs; namely, the rewards bear no direct relation to the individual's efforts. Bonuses, especially, are frequently resented by the rank and file of workers because they suggest paternalistic gifts too often distributed at a time calculated to undermine independent employee organizations. Quite apart from this aspect, the bonus system may engender unwarranted expectations that similar disbursements may be due in the future. If these disbursements do not materialize when expected, employee morale may appreciably decline. Employees are also quite likely to feel that the payment of a bonus is evidence that the management ought to pay higher regular wages; wages, moreover, which management in the payment of the bonus has tacitly admitted belong to the workers. It is clear that bonuses for production workers have great potentialities for ill will.

Profit-sharing schemes, in addition to being open to many of the

previous objections, have one or two undesirable features not found in the other procedures. Where management has promised a given percentage (usually 3 to 10 per cent) to the workers, to be paid semiannually or quarterly, the men tend to count on the extra income. The wage earner is likely to improve his mode of living beyond the justified limits of his regular wage, expecting to clear up debts or installment payments when he receives his share of the profits. The system works satisfactorily until recessions set in or when business conditions drastically reduce the employee's share of profits. The extra check may not cover the obligations assumed by the employee. The system, therefore, tends to contribute to insecurity. Most wage earners live too close to subsistence levels to assume business risks of this kind. Profit sharing in practice tends to force on the workers some business risk where these schemes are found in companies paying regular wages slightly lower than comparable organizations not sharing profits.

A second difficulty with profit-sharing plans lies in the inability of many employees to understand the company's financial statement, and the complicated calculations that eventually tell how much each man is entitled to. The necessity for depreciation funds, overhead charges, special services, and similar items is rarely appreciated. A worker may become suspicious and disgruntled if he reads that his company did a gross business of \$5,000,000 when his own share of the profits was only \$12.42.

It is not to be supposed that all of these methods of providing extra remuneration have failed dismally wherever they have been applied. One company has shared profits with employees for a period of fifty-one years. Other organizations have reported singular success with stock-purchase plans and bonuses. Each of the incentive wage systems has its own list of supporting companies. The reasons for the relative success of a given plan can usually be found in local conditions or personalities. The principal objective in this section has been to show that no single wage or payment system is best. All have their defects. A given industry in a given locality dealing with a given type of worker is called upon to pick that reward system which presents the fewest difficulties and the greatest effectiveness in that particular situation. No general recommendations on this score can be made.

## 3. NONFINANCIAL REWARDS

It has been pointed out that piece-rate systems, introduced to stimulate production, have in many cases restricted production. Day-rate methods of pay, on the other hand, were found to be inefficient for many types of work. Bonuses, profit sharing, and similar extra-wage financial rewards also present formidable difficulties. Even when men are given adequate and sometimes generous financial rewards, unrest and discontent may prevail. Are workers just naturally greedy for money? Can they not be satisfied by any reasonable means? Must industry face a continual struggle with labor and labor organizers? To a very large extent management in the past has operated on the false assumption that men work solely for economic reasons: for profits or wages. Implicit in this point of view is the notion that work is essentially objectionable. It affirms that labor is endured only to prevent other kinds of suffering that are still more objectionable. At the very least, this point of view ignores important facts of human behavior that even managers would recognize in themselves if they were not blinded by the brilliance of their own economic success.

First of all, every careful observer of human and animal behavior has noted a deep-rooted tendency toward action rather than quiescence. When one craves relief from chores he usually looks not for a complete "loaf" but merely for a different kind of activity. Periods of relaxation and rest are enjoyed the more because of previous work, but when energies are again marshaled resting becomes tedious boredom. Nor is all the desirable activity in the form of sport. Some men drive automobiles, play chess, chop wood, sketch landscapes, milk cows, and husk corn for a living while others do the same jobs for recreation. Work, productive or nonproductive, is not necessarily objectionable. Moreover, the lures that entice men to work are not wholly monetary, as the continued efforts of rich men testify. For each normal person there is at least one kind of work that is enjoyed for its own sake, irrespective of its monetary return.

In support of this point of view is a pair of surveys, both designed to discover those features of employment which the workers consider important. The first of these studies covered a group of 100

male department-store employees and 150 other young men employed in a wide variety of occupations. The second included 325 women working in English factories. The variety of people surveyed makes the agreement in the findings all the more significant. The numbers in the table below indicate the relative rank of each factor in the opinion of the workers, 1 being most important and 12 being least important. (The English survey used only ten of the factors originally employed with the American workers.)

*Table 9. Relative Importance of Factors of Employment*

<i>Factors</i>	<i>325 Women</i>	<i>100 Clerks</i>	<i>150 Miscellaneous Workers</i>
Opportunity for advancement	5	1	1
Steady work	1	2	2
Opportunity to use own ideas	7	3	3
Opportunity to learn a job	8	4	4
Good boss	4	5	6
Opportunity for public service		7	5
High pay	6	6	7
Good working companions	3	8	8
Comfortable working conditions	2	9	9
Good hours	9	10	11
Clean work		11	10
Easy work	10	12	12

As one inspects this table a number of surprises appear. Good hours and easy work are rated very low. Even high pay fails to stand out as one of the most important factors. The most immediate economic rewards are rated below intangible returns such as security (steady work), and opportunity for advancement through the use of one's originality. Among the English women, purely social matters carry considerable weight as shown by the relatively high ratings of Good Companions and Good Boss. To paraphrase a Biblical quotation, "Man does not work for bread alone."

The economist and conservative industrialist may protest our interpretation and point to the great number of strikes that are called because employees demand more wages and shorter hours. Two considerations may temper whatever interpretations are drawn from this line of argument. First, the number of strikes in which wages and hours are the major issue is probably exaggerated in the opinion of most people. The United States Labor Department

reported that out of the 2508 strikes recorded in 1940 only 30 per cent involved disputes over wages and hours as the major issue.<sup>3</sup> Second, employees receiving good wages and working moderate hours, if deprived of the kind of supervision that dispenses the psychological wages of work, frequently take the attitude, "Well, if the company wants to treat me that way, I'm going to get more money. They can't push me around for \$35 a week." When the worker fails to receive satisfactions other than those derived from the pay envelope, he feels that he has been cheated and the only way he knows of squaring accounts is to demand either higher wages or shorter hours, neither of which really eliminates the source of discontent.

Let us consider some of the forms of nonfinancial returns that frequently spell the difference between a management-employee relationship that is congenial and one that is shot through with suspicion and distrust.

### *Security*

"Yes, our wages here are nearly twice the regular rates in our line o' work — we get the highest pay of any railroad men in the world," confided a certain group of employees recently. "But we'll give you ten dollars a head for every man you can find amongst us who isn't swearing mad at the company. The reason?—W'y, you see, we've got no 'conditions.' Not one of us but can be fired to-morrow."<sup>4</sup>

What many workers want are not high piece rates, shorter hours, more money, but rather a measure of security—certainty of employment. One of the probable but less obvious reasons for labor's preoccupation with wage demands has been the belief that only through high wages could some measure of security be attained. High wages and the savings from them are not impregnable bulwarks against insecurity, particularly in severe or prolonged periods of economic depression when security is most prized. Efforts accordingly have been made to provide security more directly without the necessity for high wages. Guaranteed employment is aimed to this end. The experience of a number of industrial concerns like Nunn-Bush and Hormel demonstrates that men will work

for a somewhat lower immediate reward if they can be assured constancy of employment.

Efforts to stabilize employment and avoid temporary layoffs are supported by a long array of economic arguments. Quite apart from these considerations, which have no proper place at this point, is the psychological basis for assuring competent men a degree of job tenure.

In an industry subjected to erratic fluctuations in employment the income of the workers may vary over such a wide range that budgeting of money becomes a practical impossibility in just those income brackets where it is most necessary. The periods of relative prosperity engender an ill-founded feeling of financial independence. At such times workers may acquire obligations on furniture, a radio, a new car, or a refrigerator. Debts mount. The uncertain wages of the future are mortgaged. Business conditions change. Wages are reduced or eliminated and the worker reacts unfavorably against the employer for not paying higher wages to meet installment payments. Even during the period of employment, the employee's inability to fathom the future in its essential outline produces worry, tension, and anxiety which may very easily find expression in antagonism against real or fancied mismanagement of the organization for which he works.

"For the last eight months I've been workin' practically every day," a thoughtful carpenter confided. "But I swear to God, there wasn't hardly an hour of it but my heart jumped every time the Boss started my way, fearin' that he was comin' to lay me off. And not once, I tell you, did I ever get home ten minutes before my regular time but my wife, she seen me comin' down the street and ran out to the gate to meet me—askin' me always with a catch in her throat—'Has it come? Tom, tell me quick! Has it come?' "5

Many industrial concerns have found a partial solution to the problem of job security by training employees for versatility during slack periods. In this way men may be shifted from departments producing for stock to those producing for immediate delivery. An automotive plant has made a practice of frequent transfers from one department to another so that workers may become skillful at a number of operations. This company reports that the practice

"has prevented favoritism, kept workers from 'getting in a rut' and brought to light a number of promising men who might otherwise have worked for years without recognition." <sup>6</sup>

Of 157 companies covered in a study by the National Industrial Conference Board, 35.7 per cent reported some effort to teach a substantial number of workers a variety of operations. <sup>7</sup> Others in an informal manner encouraged workers to learn additional operations. Transfer within a department or within a plant is relatively easy, provided the operations do not necessitate long periods of training.

Transfers are not always willingly accepted by the workers. The sense of security engendered by complete mastery of a given job is sometimes lost if the new task differs markedly from the old. Where transfers have previously been the signal for demotion or discharge they are likely to be vigorously resisted. On the other hand, this difficulty can be avoided if workers are told that the company values their services and is instituting periodic transfers for those of exceptional ability. Thus, being picked for transfer may become a sign of superiority and will then be gladly accepted.

Returning to the matter of transfers again, it is interesting to note that only about 5 per cent of the companies included in the National Industrial Conference Board report mentioned above, found such a procedure unsatisfactory because of the employee's attitude. The report summarizes:

The final impression gained from a study of experience with interdepartment transfer systems is that for recessions of limited severity these plans, particularly when their foundation has been laid in training for versatility, offer management an excellent means of retaining desirable employees . . . . However, even employers whose experience has not been entirely satisfactory indicated that in their belief the advantages to both management and employees outweighed the disadvantages. <sup>8</sup>

The American Legion established in 1939 an Employment Stabilization Service for the purpose of providing employers with research data and suggestions on this problem. This service has collected a great file of case histories showing how various enterprises have stabilized employee incomes. Sometimes this has been accomplished by saving maintenance and repair work for slack

periods; by arrangements with other companies needing extra men during off seasons (a coal dealer leased men and equipment during a summer to a trucking contractor); by agreement with workers to provide a stated average number of working hours per week throughout the year; even though seasonal demands may call for sixty hours on some weeks and only ten hours on others. These represent only a sample of the devices available to employers interested in providing an important psychology wage.

Job security is one of those intangibles for which men work. Management need no longer feel helpless to provide such a reward. It is an economically sound aim, contributing to employee morale.

One basic principle to bear in mind in this connection, as well as in many other situations to which reference will be made, is this: Whenever changes in working conditions, methods of pay, operations, or other similar factors are contemplated, conferences with employees designed to acquaint them with the reasons for the changes will eliminate many personnel difficulties. Unannounced shifts in policy or in the worker's status undermine confidence and contribute to feelings of insecurity.

The importance of this principle is well illustrated in a number of cases coming before the Federal agencies charged with arbitrating labor disputes. In one rather typical case it became necessary to consolidate two departments in a clothing manufacturing concern. The management expected that one of the foremen would be ill for a prolonged period and it was for this reason that the two departments were to be housed together. In making the shift there was no intention to reorganize the actual operations among the workers in the two departments. One group was merely moved from its original location on the first floor to the fifth floor where the second department was already working. Without explanation or preliminaries the workers walked onto the fifth floor and took their assigned places, whereupon the entire floor became a scene of excited turmoil. Enquiry revealed that the fifth-floor employees were under the impression that the other department was sent upstairs to spread the available work. Fifteen minutes of frank discussion with the workers would have prevented a threatened walkout.

In another case the clothing manufacturer decided to shift from



making inexpensive garments to quality merchandise. The initial move was to import foremen who were experienced in making higher priced suits, topcoats, and overcoats. No attempt was made to enlist employee enthusiasm in the venture before the new foremen proceeded to carry out the necessary instructional program, disrupting old established habits and moving employees about from one location to another. These innovations in the familiar routine of the shop met with considerable resistance, finally crystallizing in the demand for "quality wages for quality work." In the years that followed the company succeeded in making a place for itself in the quality trade, largely because of exceptionally brilliant sales work, but throughout that time relations with the workers have been marked by a long series of bickering disputes. Unhappily the workers have no feeling of pride in the part they actually played in helping to attain a remarkable achievement in the industry.

Workers want a sense of security that comes from reasonably steady employment under a management they can rely upon to inform them in advance of any important changes in working conditions.

### *Social Approval*

Numerous students of industrial personnel problems are in agreement that one of the psychological rewards of work is the standing of an employee among his fellows. The importance and skill of a job as judged principally by fellow workers is almost as potent a reward as the pay check. Thus the coal-face worker takes a part of his wages in the satisfaction he gets when others stand aside to let him go down the shaft first. The steel worker in the "hot mill" gets a "mental wage" each time he is reminded that not many others have the stamina required for his job.

Wages are not entirely divorced from the social approval reward. Many modern industrial performances are so specialized that the average person is unacquainted with the skill required or the importance of the operation. The only measure that the community at large has for judging a man's job is frequently the size of his pay check. Consequently, a man's wage in dollars and cents is often a persuasive symbol to those outside his immediate work-

ing group of his job's consequence. The pay check's dual role, first as a financial reward and second as a measure of job importance, may account for much of the worker's preoccupation with wages and wage differentials.

Promotions entail frequently a psychological bonus. During the 1930 depression, morale was maintained in some college faculties by granting increases in professorial rank with a decrease in salary. The higher salary that usually accompanies a raise in rank is often of less importance than the subjective reward in the knowledge that others recognize one's worth.

Throughout the industrial hierarchy is a system of social caste. Distinctions are drawn between bums and hobos at one extreme, as well as between supervisors and managers at the other extreme. While there is unquestionably a diffused kind of social approval that ranks the banker higher than the small retail grocer, it is of less consequence than the commendations of one's immediate social group. The skilled automobile mechanic is concerned that he stand well in the eyes of other mechanics. He feels no degradation because he has not equaled the achievements of automotive engineers. Contrariwise, approval by others outside one's associates can rarely balance the loss of respect among fellow workers.

The truth of these generalizations has been demonstrated in the very careful studies of informal groups that establish themselves within any organization where people work together. Sometimes these associations cut across the organizational divisions between foreman and workers. When they do, conditions are ripe for enlisting worker efforts to achieve the hoped-for aims of management. However, more frequently the opposite conditions prevail. For example, in the Hawthorne plant of the Western Electric Company a gang of men engaged in wiring and soldering tasks was very closely studied for some months, with their complete knowledge. It became quite clear to the observer that production in this gang was to a very large extent controlled not by the foreman or the inspector, but by one of the men who was respected by a large part of the group. When a worker attempted to do either more or less than the usual day's work, he was "disciplined" by the group leader or by some other member of the group with the leader's tacit consent. In effect, the social organization in this

gang was such as to thwart any change imposed through the usual lines of managerial control. On the other hand, a group of women employed in assembling telephone relays was likewise studied for a somewhat different reason. In this case the associations established were such as to dovetail readily with the management's aims, for no stigma was attached to the assembler who produced more than her daily quota.

The implications from these considerations of social approval so far as management is concerned, are quite evident. If the policies of the organization are to be effectively executed they must be compatible with the practices that are approved by the rank and file. If a given policy is not in step with the worker's customs or approved practices, then management, if it is to avoid difficulties, must either embark on an educational program to change employee attitudes or must modify its policy. The extent to which a given policy forces a man to choose between approval from the foreman and approval from his fellow workers is a measure of management's failure to appreciate the importance of the social approval drive. Furthermore, the approval of fellow workers often far outweighs the approval of the foremen and supervisors.

### *Knowledge of Purpose and Results*

A gang of men was ordered by their foreman to dig a hole at a designated spot in an open field. After some digging they were told to fill it with the dirt they had just removed. They moved off a few paces where the foreman again asked them to dig another hole. When the whole procedure was repeated, resentment mounted and finally broke into open insubordination. Had the foreman merely informed his gang in advance that they were looking for a water main, trouble could have been avoided. Mere knowledge of the purpose of a given job contributes to job satisfaction.

In modern industry it is sometimes difficult to give workers a conception of the way in which their individual efforts contribute to a common end, particularly when the product is mechanically complex. The people at the beginning of the subassembly lines are so far removed from the finished unit that they sometimes feel their work is detached, unimportant, and fruitless. This is particularly true in the supply industries which provide semifinished

materials. One steel company found a noticeable lift in morale when the workers were told the destination of each batch of steel. The fact that the men knew the steel in front of them would eventually become Buick springs or Pennsylvania Railroad rails added interest and gave point to their efforts.

In this connection the very significant series of studies reported from the Hawthorne Plant of the Western Electric Company are of some interest.<sup>9</sup> The purpose of one of these investigations was to determine the optimal physical conditions of work and the most effective incentive wage. The group of relay assemblers, referred to above, was set to work in a special test room where lighting, ventilation, and supervision could be varied without affecting the main portion of the assembling section. At various stages in the study rest periods were introduced, morning lunches provided, methods of payment changed. After more than two years of study and systematic variation of working conditions, the investigators came to the conclusion that the most important factor determining output was not the kind of wage system in effect nor the number of rest periods nor even the illumination. The results showed that each time changes took place in the physical conditions or wage system, output increased *even when the original conditions in effect at the beginning were reinstated*. The only satisfactory explanation which the authors offer attributes these unexpected results to the fact that before each contemplated change the assemblers were called into conference by the supervisor, who explained the purpose, nature, and reason for the changes. This cooperative, sympathetic, considerate treatment that emphasized objectives and purposes of work had such an important effect upon output that the influence of all the experimental conditions was almost completely obscured. Workers want to know the end and purpose of their work.

### *Recognition of Unusual Performance*

Management's frequent recognition of unusual performances on the part of employees has an indirect effect upon morale and is unquestionably one of the rewards which many men prize. Individual workmen with unusually fine safety records, long periods of satisfactory service to the organization, or an outstanding performance in production are sometimes formally recognized through

special awards of plaques, medals, service stripes, or scrolls. The intrinsic value of such awards is nominal. Their symbolic value as tangible evidence of management's sincere concern and appreciation for a job well done is all-important. Judicious and sincere use of such devices satisfies a psychological craving for individual recognition. A man likes to be thought of as a person, not as a "hand" or as operator No. 123. Special awards of the kind just mentioned tend to "individualize" workers, giving them the social approval and respect of their fellows which was emphasized in an earlier section.

### *Desire for Communication with Management*

At various points throughout the preceding two chapters emphasis has been placed on the necessity for a management that is sensitive to the "tremendous trifles" of human relationships. Carefully conducted time and motion studies designed to increase efficiency and establish equitable wage-incentive plans, provisions for adequate lighting, ventilation, rest pauses, noise control, hospital benefits, and the like, produce their beneficial effects if they are interpreted as evidence of management's interest in the employees as individuals.

With the development during the past three decades of large-scale business enterprises, the distance separating the benchworkers from the general policy-forming executives has increased to such a degree that informal communication between these two ends of the organization is nearly impossible. In small concerns enlightened managers know their men personally, and can understand and often anticipate grievances. Changes in policy are introduced gradually after informally "sounding out" employees or convincing them that the changes are desirable. In turn, the employees often make suggestions for improvements. As large industries became larger, employing thousands of workers, little or no provisions were made in the organizational structure to continue this informal interchange of ideas. Furthermore, when union organizers penetrated the ranks of labor, creating strife in plants where there was at least a surface calm, management developed an understandable antagonism to all efforts designed to reestablish extraorganizational lines of communication between workers and

employers. When union committees tried to formalize a method for communicating and settling their grievances, management often felt that labor was outgrowing its overalls and was selfishly grasping for power without thought for the financial well-being of the enterprise.

Considering the long sweep of cultural evolution that minimizes rackeering and factional struggles for power within organized labor, it is possible to interpret the rise of unionism in America as an attempt to regain the nonfinancial satisfactions of two-way communication with management, satisfaction which labor experienced in an earlier era of small enterprises.

The evidence supporting this interpretation comes from a number of sources. First is the growing body of case histories from concerns in all parts of the country, where management and unions have collaborated amicably in the settlement of their differences, to their mutual benefit. Consider, for instance, the Parafine Companies, Inc., makers of Pabco roofing, floor coverings and paints, and employing 1500 workers. Wages were among the highest in the industry. Employees were provided with group insurance, vacations with pay, recreational facilities, and turkeys for everybody on Thanksgiving and Christmas. The management felt they had a contented working force, immune to union appeals. A secret ballot proved the contrary, and eighteen unions quickly established locals within the plant. Instead of bucking the unions, the management began an intensive drive to "sell" the company policies to the unions and the men through full-page, forcefully written, and dramatically illustrated advertisements, handed to employees twice a week. These advertisements told the story of raw materials, the real meaning of "efficiency," the cost of waste, the virtues of a new insulation material, and the distribution of the "Pabco dollar." Adequate grievance machinery was established to the liking of both management and the unions. When the men were convinced that the reduction of waste would ultimately help the company and themselves in competition with the rest of the trade, suggestions to this end multiplied. One surprise came when a delegation of union men urged the purchase of Pabco brands to a neighboring community about to buy floor coverings for a public building. Their efforts clinched the deal. Other unions have

engaged in similar selling and advertising campaigns.<sup>10</sup> The experience of organizations such as Cluett, Peabody & Company (clothing), Doehler Die Casting Company, Studebaker, and others, has followed a pattern similar to Parafine Companies, Inc. If the employees are heard by management, if their demands are given a fair hearing and a speedy settlement, the management need not fear financial ruin because of exorbitant labor costs.

The second line of evidence supporting the interpretation that workers want a two-way system of communication with management rather than power, comes again from the studies such as those of the Hawthorne Plant of the Western Electric Company, where a large staff of interviewers, or "skilled listeners," make a regular practice of talking informally with workers to get their point of view on company practices or other topics that may even indirectly affect their work. Employees welcome the opportunity to talk with these interviewers, for they know that adverse criticisms of the company will be reported anonymously; that complaints will receive a just hearing; that personal problems will not be ignored. In this plant little or no union activity is in evidence, simply because the workers have had for the past ten years the sense of security and well-being in a free exchange of ideas with management in an atmosphere of mutual respect. As one looks around at other concerns, with stabilized harmonious labor relations where unions are virtually nonexistent, one finds evidence of a similar if less formalized communication between workers and top management.

Third in the list of conditions that support the thesis that labor as a class is not interested in gaining power but only in gaining a fair hearing, is the widespread dislike and unwillingness of large masses of workers to accept executive responsibilities. It is a mistake to assume that everybody wants to be president. At a more modest level, many chain-store clerks honestly prefer to remain as clerks rather than step into a job as store manager. Throughout the rank and file of production workers, large numbers flatly refuse promotions to positions of greater responsibility. Indeed, some psychologists have gone so far as to say that everyone likes to feel submissive to at least *the right person*. What we have just said does

not mean that certain labor leaders do not want power. But the rank and file support these union leaders not in the hope of gaining power for themselves but rather because unions provide the avenue of communication with management, let the power fall where it may.

Fourth, and finally, one of the important lessons of management in the recent past, since collective-bargaining practices have become mandatory, is the necessity for negotiating with the immediate employees as well as the union officials from the national or regional headquarters. Professor B. M. Selekman, skilled arbitrator of industrial disputes, has reported a number of cases from his experience in which continued labor disturbances have occurred after management signed agreements direct with the top union officials without inviting men from their own pay rolls to help in the negotiations. In case after case where the local representatives have been excluded from the conferences, the final results have been unhappy. Union officials as well as management need to realize that the normal desire to participate in shop government cannot be frustrated except at some peril even to their control over their own unions. Local leaders who are denied official participation in the final conferences develop unofficial methods of making themselves felt, a fact demonstrated by many "outlaw" strikes.

It is significant in this connection that a 1940 *Fortune* poll showed that a majority of workers felt that half or more of the employers were fair as regards hours, working conditions, and wages. The employers, however, measured up poorest in the workers' opinions in the matter of collective bargaining.<sup>11</sup>

What the rank and file want is a democratic voice, a fair hearing, in the councils of management that touch their jobs—not the power to dictate to business on how to buy, sell, or finance itself. Alfred Marshall complained once that half the world's best brains were submerged, unconsulted, in the working class. It may be years before these brains can, or will be allowed to collaborate with management in the solution of their common problems to their mutual benefit. Nevertheless, the trend of the times is certainly in that direction, as evidenced by the management-labor councils established in 1942 at the suggestion of Donald Nelson,



Director of War Production. The phenomenal changes in methods brought about by suggestions developed in these councils have contributed to the "miracles of production" witnessed in 1942.

### *Unique Individual Factors*

The factors discussed so far in this and the previous chapter approach the problem of industrial efficiency from the group standpoint. That is to say, there may be an equitable wage system, job security, satisfactory collective-bargaining machinery, and good physical conditions of work. But in addition to these factors affecting the entire working force, individual unique factors often play an important part. Efforts are now being directed at a more individualized treatment of employees.

Obviously to adjust the worker more perfectly to his job or the job to him, it is necessary to discover his elusive desires, ambitions, attitudes, preoccupations, apprehensions, and expectations. Perhaps the most satisfactory way of gaining such information is through the use of trained interviewers or observers—a method that is both expensive and difficult to reduce to quantitative terms. However, the results obtained by interviews are particularly illuminating in that they sometimes reveal the subtle factors which by devious means contribute to lowered efficiency and morale.

The following sample cases are part of an extensive report on the experiments in personnel relations initiated at the Hawthorne Plant of the Western Electric Company in 1927.

*Effect of Personal Conflict on Production.* In an interview with W7 on December 7 which was shortly after his rate began to decrease, he made quite a point of the fact that he was turning out more work than W9 but was getting less money. He was also disgruntled because he had not been regraded, which he thought he deserved. Although W7 had been interviewed before, this was the first time that he expressed this complaint. Yet the discrepancy between the earnings and output of W9 was not a new discovery to W7. In fact, it was fairly common knowledge among all the associates of W9. Why, then, did W7 become so disgruntled at this time?

In the first interview with W7 which took place in early November, W7 said that he was going with a girl who was living alone in the city and earning her own living. He was thinking of marriage, but he said that he needed more money before he could get married. At the time, this situa-

tion did not worry him greatly because both he and his girl were working and they saw each other frequently. When the interviewer saw W7 the second time, this situation had changed. His girl had been placed on shorter hours, and she was faced with the possibility of unemployment. This meant a great deal to W7. If his girl were laid off, he would be faced with an alternative of letting her go back to North Dakota and live with her parents, thus risking the possibility of never seeing her again, or of marrying her. Since he was in love with her, the latter choice seemed to be the more desirable solution. His output curve started downward at about the time he was first confronted with this situation. His earnings had now taken on a new significance. It was no longer simply a question of whether he could support himself, but a question of whether he could through his earnings preserve a relationship which meant a great deal to him. This growing preoccupation probably accounts for the fact that at this particular time he became disgruntled with his own earnings, especially as compared with W9's earnings. The downward trend in W7's output continued all during the period of indecision. Finally, on January 7 after sitting around most of the day and being unable to work, he announced his intention of getting married. He did so two days later. During the next week his output curve started upward and in the second week thereafter it reached the highest point up to that time. The conflict had been resolved.<sup>12</sup>

*Slight Changes in Work May Make Marked Changes in Attitude.* Changes in the social significance of work are not confined to changes in the job alone. The physical task may remain the same but its social significance may be altered by changes in working conditions. For instance, if the only visible difference between two levels of supervisors is the size or arrangement of the desk, the color of the carpet, or the kind of calendar pad each supervisor has, that difference, as any one who has lived in such situations knows, assumes considerable significance, not only to the supervisors but to the people reporting to them. The following incident illustrates how important such small things become in situations permeated with social significance.

The personnel of one of the departments interviewed was moved from one building to another. In the new location, because of lack of space, it was found necessary to seat four people across the aisle from the remainder of the group. It happened that there were three women in the department who were to be transferred to other work. These women were given desks across the aisle so that their going would not necessitate a rearrangement of desks. The fourth person, a man, was given a desk there simply because there was no other place for him to sit. In choosing the fourth person,

the supervisor was undoubtedly influenced by the fact that he was older than the rest of the group and was well acquainted with the three women. But beyond that, nothing was implied by the fact that he was chosen. Now see how this employee interpreted the change in his seating position. He felt that his supervisor evaluated him in the same way in which he evaluated the women. The women were being transferred to other types of work; consequently, he felt that he too would be transferred before long. Two of the women were being returned to jobs in the shop. He felt that he himself might be transferred to the shop, and there was nothing he dreaded more. Having dwelt on speculations like these for a while, the employee recalled with alarm that his name had been omitted from the current issue of the house telephone directory. This omission had been accidental. The house telephone directory, however, constituted a sort of social register. Names of shop people below the rank of assistant foreman were not printed unless they were employed in some special capacity requiring contacts with other organizations. With the exception of typists and certain clerical groups, the names of all office people were listed. The fact that his name had been omitted from the directory now took on new significance for the employee. It tended to reinforce his growing conviction that he was about to be transferred to a shop position. He became so preoccupied over what might happen to him that for a time he could scarcely work.<sup>13</sup>

These two illustrations give some indication of the importance of subjective factors in production that are difficult to classify. Generalizations relating to ways and means of dealing with such factors virtually defy formulation. All those in supervisory capacities from foremen to vice-president-in-charge-of-personnel must be constantly on the alert to detect and correct conditions peculiar to individual workers that detract from morale.

Where a regular system of periodic interviews is established as in the Hawthorne Plant, a marked lift in morale is noticeable. Employees are then not looked upon as so many "hands" or as brass time checks serving as mere appendages to cold, unemotional machines. They are persons, each of a slightly different mold with unique work and home problems of varying degrees of importance and urgency. Few stereotyped procedures are possible. In such an atmosphere labor turnover is minimized, morale is on a high plane, and work efficiency is near its maximum.

#### 4. WAYS OF MEASURING THE EFFECTIVENESS OF PSYCHOLOGICAL REWARDS

No doubt every employer will agree that he wants his employees to be as content and satisfied in their relations with the organization as possible. But just how is the top management, particularly in large enterprises, to gain dependable information of worker dissatisfactions until moderately serious disputes break out that no one can ignore?

The vast majority of enterprises in America depend upon foremen or supervisors to report on the attitudes, feelings, and grievances of the men in their charge. This system apparently works tolerably well, especially if it is supplemented with some kind of worker-representation councils. However, in one case where the usual machinery was established, only seven grievances came to light in nine months. An officer of the company commented, "Either we are awfully good or our grievance system is no good at all, and I am inclined to think the latter is the case."<sup>14</sup>

Aside from dependence upon foremen for reports of employee attitudes, at least three other methods have been developed for this purpose. First is the "skilled-listener" technique typified by the Hawthorne Plant studies to which reference has already been made. Second are the straight questionnaires relating to managerial policies. Third is the use of attitude measurement scales originally devised by Thurstone and adapted to industrial use by Uhrbrock.<sup>15</sup> The latter two methods warrant detailed consideration.

Questionnaires for purposes of gaining insight into employee attitudes must be used with considerable care if the returns are to be of much value. In some cases it has been found wise to employ an outside agency to conduct what has been called an "Audit of Employee Morale." The procedure ordinarily calls for the administration of the questionnaire in groups of about seventy-five workers to whom the "auditor" is introduced by some representative of management. The questions require either a short written answer or a check mark opposite appropriate responses. In order further to ensure complete frankness on the part of employees the returns are not usually identified except possibly by department. The extent to which such a survey accurately mirrors employee feelings de-

pendents to no small measure on the cooperation obtained by the outside auditor. Typical questions on such a blank are:

How much does the management care about the welfare of people in jobs such as yours?

Do the people above you understand all or almost all of the difficulties of your job?

If you have a grievance are you reasonably sure of being able to get a fair hearing and a square deal?

Are some departments more favored than others?

Are you judged more by the quality of your work or the amount of it?

Do you believe the company's seniority policy is operating fairly?

Are you reasonably sure of being able to keep your job as long as you do good work?

Is any favoritism shown in your department?

The bare results from a survey of this kind can be used either to give an over-all indication of the morale level or specific items may suggest important changes in policy. In one study the fact that only 29 per cent of the workers believed the best qualified people were promoted to better jobs, suggested the desirability of more adequate records of individual qualifications. Or again, since only 30 per cent of the workers believed they were judged more by the quality than by the amount of work, it was felt that more suitable recognition should be devised for high quality production. The need for more attention to delineate areas of authority and responsibility lines came from the discovery that only 37 per cent of the employees felt they had never received contradictory or conflicting orders.<sup>16</sup> In other situations one may find that the minor executives have a lower morale score (that is, they find more fault with the company) than the rank and file, possibly indicating that the middle class of employees have been the forgotten men when the nonfinancial rewards have been dispersed. However, not always are the results of a morale audit easily interpreted. But to be of any real value they must be sifted to find corrective measures that will lead to better employee relations.

The attitude scale technique was originally devised by Thurstone and calls for the standardization of single-sentence statements in terms of a numerical scale (usually varying from 1 to 11), representing degrees of favorable or unfavorable attitude toward the issue in question. In applying this technique to the industrial situation, Uhrbrock submitted to college-graduate students a batch of 279

statements with instructions to arrange them in eleven piles according to the degree of favorableness: pile one being those statements least favorable to the company and pile eleven being the most favorable. Out of the 279 statements originally submitted, only fifty were retained in the final scale, these being the statements on which there was best agreement as to position in the 11-point scale and at the same time providing an equal number of favorable and unfavorable statements. The following items illustrate the kind finally selected.

#### Attitude Statement

*Scale*

*Value*

- 10.4 I think this company treats its employees better than any other company does.
- 9 5 If I had to do it over again, I'd still work for this company.
- 8 9 A man can get ahead in this company if he tries.
- 8 5 The company is sincere in wanting to know what its employees think about it.
- 7.9 A wage incentive plan offers a just reward for the faster worker.
- 7.4 On the whole, the company treats us about as well as we deserve.
- 6.3 I think a man should go to the hospital for even a scratch as it may stop blood poisoning.
- 5 4 I believe accidents will happen, no matter what you do about them
- 5 1 The workers put as much over on the company as the company puts over on them.
- 4 4 The company does too much welfare work
- 3 6 I do not think applicants for employment are treated courteously.
- 3 2 I believe many good suggestions are killed by the bosses
- 2.5 I think the company goes outside to fill good jobs instead of promoting men who are here.
- 2.1 You've got to have "pull" with certain people around here to get ahead.
- 1 5 In the long run this company will "put it over" on you.
- 0 8 An honest man fails in this company

The scale as submitted to the workers, of course, does not contain the scale values. Instead, employees are asked merely to indicate by suitable check marks which of the statements they agree with. As in the questionnaire procedure, no names are signed to the response sheets, although department, sex, duration of employment, and other matters may be indicated. The attitude score is obtained by taking the median value of all statements with which the employee agrees.

Uhrbrock has used this method in determining the attitudes of more than four thousand employees in at least four factories. As

one would expect, the foremen had a higher average attitudes score (7.19) than office clerks (6.89), who in turn rated higher than factory workers (6.34).

The advantage which the attitude scale has over the questionnaire lies in the fact that the employees are given the opportunity to express themselves either for or against the company in a way which makes possible a fairly accurate measure of the total attitude of employees. That is to say, in computing the final score a minor complaint may be more than counterbalanced by checking a statement with a high scale value. The various policies and practices of the concern are given weights in proportion to their importance. Possibly the questionnaire method gives a somewhat clearer picture with regard to the specific policies that need correction or revision. Moreover, the questionnaire method can be readily adjusted to special conditions found in particular enterprises while the attitudes scale necessitates the cooperation of a large group of persons to agree on the scale value of each statement used.

The heart of the modern industrial-relations problem is centered in the ways of providing rewards for work that give relatively permanent worker satisfactions over and above the pay check, without the paternalism which employees quickly sense and vehemently reject. This is a difficult assignment for any management of a large-scale enterprise. An employee morale audit makes the assignment somewhat easier of attainment.

## 5. SUMMARY

Rewards for work are of two kinds: financial and nonfinancial. The former have been emphasized with little or belated attention to the latter. The "pulling power" of financial rewards has been enhanced in some cases by the introduction of some form of piece-rate system. Such systems, however, are not always productive of the results for which they are designed. Stock purchase plans, profit-sharing, bonuses, and similar forms of extra remuneration have been found satisfactory as incentives to extra effort in some establishments but are subject to rather serious objections, especially in times of economic stress when a special effort for high efficiency is most imperative.

Nonfinancial rewards in the form of greater security, social approval, knowledge of the job's purpose and the results of one's efforts, awards and recognition for unusual performances, have not been generally utilized to their full value in many establishments. Nonfinancial rewards, as important supplements to fair and equitable financial returns, possess the advantage of being applicable at all times, regardless of economic conditions. The rewards for work must be adapted to the workers' wants. When they are, efficiency and morale will be on a high plane.

A quotation from Thorndike serves well in summarizing this chapter:

In general, the reward for labor is not only the power to buy food, shelter, clothes, and whatever else money will buy which comes as a money wage, but the degree of gratification given to each and every human craving by the job itself. The evil of work to the worker is not only that he has to work so long for so little, but that he may have to strain his powers at work for which he is not fit, submit to rule that is humiliating, lose caste in his world, and in general be thwarted in the fundamental impulses of his nature.<sup>17</sup>



## Chapter II

### INDUSTRIAL AND HIGHWAY ACCIDENTS

Accidents from a purely economic standpoint represent an unproductive charge against industrial activity. From the humanitarian standpoint they are unfortunate disasters, bringing in their train human suffering, pain, blasted hopes, and sometimes poverty. From the insurance standpoint they are so many statistics—cases. From the standpoint of human engineering accidents are events whose major causes can be identified with a high degree of certainty and to a large extent eliminated.\*

The importance of the accident problem can be sensed by an inspection of the bare statistics of their frequency. The National Safety Council reported in 1940, within the United States, that one person was accidentally killed and ninety-nine were injured every five and one-half minutes. In the two years of 1939 and 1940, accidental deaths in the United States totaled approximately 189,000 or about equal to the military and civil fatalities suffered by France during those years of World War II.<sup>2</sup> When accidental deaths reach a frequency comparable to war on a modern scale, no one can doubt the seriousness of the problem.

The present chapter will consider the major factors affecting the frequency of accidents in industry and on the highway. In what ways may accidents be reduced? What are the principal environmental conditions which breed accidents? What personality or psychological factors contribute to a high accident rate? These are some of the questions to be answered.

\*"The percentage of accidents which can be prevented has been placed as high as 95 per cent. Even if we assume that this figure represents an ideal level and is practically unobtainable, I think we may safely say that 75 per cent or even 50 per cent of all these accidents can be prevented."<sup>1</sup>

## 1. THE HIGH COST OF ACCIDENTS

Some further appreciation of the importance of accidents can be gleaned from a brief consideration of direct and indirect costs of accidents in industry.

In New Jersey, a small but highly industrialized state, 8947 people were injured to such an extent that they were granted workmen's compensation during 1936. In round numbers, this compensation amounted to \$2,000,000.<sup>3</sup> Pennsylvania, another industrial state with extensive mines and heavy industries, reported 131,152 accidents, of which 1246 were fatal, during 1937.<sup>4</sup> Assuming 300 working days a year, on an average four workers were killed and 400 were either temporarily or permanently disabled every day, in this single state. The United States Bureau of Labor Statistics has estimated that during 1936 the direct loss to employers was about \$150,000,000, which only includes the cost of insurance and medical benefits.

The indirect costs of accidents have been estimated to be about four times the direct charges. These incidental costs are divided among a great many items: spoiled materials, time to investigate the accident and make out the necessary reports, damaged equipment, selecting and training new men to replace the injured. One must also bear in mind that a large proportion of accidents occur in those income brackets where the family at best is slightly above or just on the subsistence level. The sharp decline in income, cushioned only slightly by insurance benefits, comes at a time when medical expenses mount. The result in these cases is a definite lowering in the standard of living, relieved somewhat by charitable agencies. Such a change from economic independence to dependency may distort and twist the outlook not only of the injured person but also of other members of his family.<sup>5</sup>

Another indirect cost of accidents is found in the time lost by coworkers. This may amount to only a few minutes in minor accidents, during which the man at the neighboring bench urges the victim to report to the health office to have a cut dressed. In a mine cave-in or explosion, the entire working force may stop work for a day or so, not necessarily because the mine is unsafe but rather because preoccupation with thoughts of those injured or killed is

not conducive to work and may actually contribute to further accidents.

Other factors, not easily evaluated, which escape ordinary notice are failure to meet contracts on time, overhead costs of idle machinery, light and heat, and other capital charges for the nonproductive time of the injured employee.

The over-all estimate of the cost of industrial accidents in the United States for one year is about \$5,000,000,000.<sup>6</sup>

During World War II accidents took on an added importance because of the time lost in the presence of a labor shortage. It was estimated that lost time as a result of industrial accidents alone reached a total of 42,000,000 man-days in 1941. Translated into weapons of war this lost time represented no small dent in the productive output of American industry.<sup>7</sup>

## 2. CAUSES OF ACCIDENTS—ENVIRONMENTAL

Most accidents have multiple causes. No one can say exactly how many accidents are the result of any single factor. Moreover, the assigned cause of an accident may not be the real cause, but may merely reflect the bias of the accident investigator who may do a thorough job or a slovenly one. An attempt to bring order out of chaos in the matter of accident reporting is found in the proposed code of the American Standards Association, which has been recommended and used by the National Safety Council. This code is too elaborate for description at this point, but the following figure illustrates the kind of information that can be obtained by its use.

It is evident that, according to this classification of accident conditions, about two out of three industrial accidents have both personal and mechanical causes. However, for the sake of simplicity of treatment, each of the causal factors will be considered as if it operated independently.

### *Lighting*

*A priori* considerations lead one to expect a close relation between prevalence of low illumination and high accident rate. Dimly lighted factory aisles conceal discarded scrap or misplaced tools which may become stumbling blocks. Reduced visual acuity,

inevitable in areas of low illumination, may prevent the workmen from seeing, for example, the dirty white warning lines on the floor that mark the path of the overhead traveling crane. Low degrees of illumination obviously blind many to hazards which under ordinary circumstances are quite evident.

In a study summarized by H. M. Vernon,<sup>8</sup> the effect of artificial as compared with daylight illumination is clearly demonstrated.

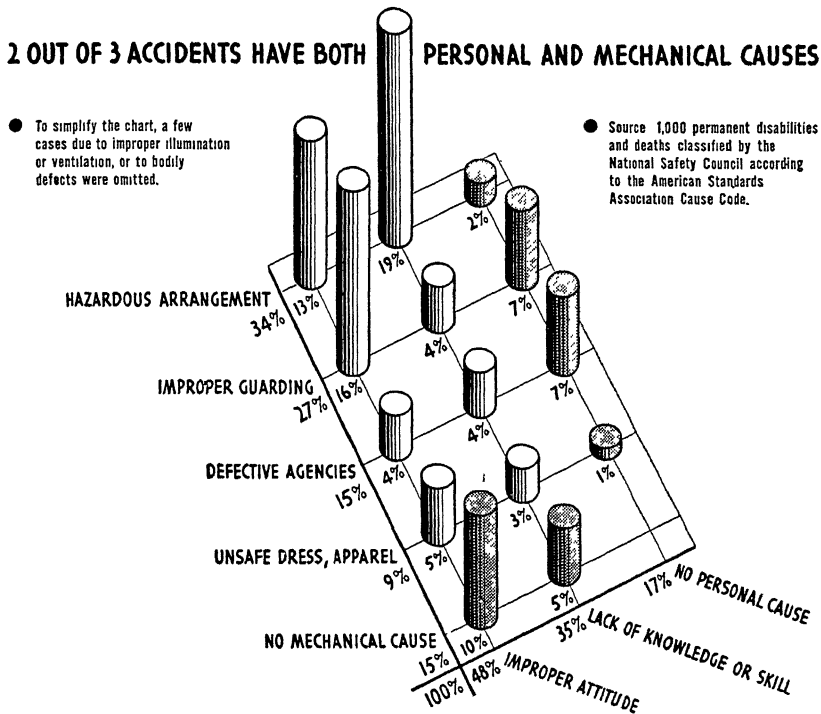


Figure 28. From *Accident Facts*, National Safety Council, Chicago, Ill., 1941.

Accident records were obtained from a number of English industries, such as dock work, textiles, shipbuilding, founding metals, building, and drink manufacturing. The great variation in the proportion of daylight in the working day throughout the year enabled the investigators to separate those accidents occurring under artificial lighting from those occurring in daylight. On an average, there was an excess of 25 per cent in accidents during hours of artificial light.

A study of 91,000 industrial accidents made in 1910 in America showed that 23.8 per cent were due to lighting conditions,<sup>9</sup> a figure which agrees remarkably well with the previously cited survey. A reorganization of the lighting facilities of the Oshkosh Overall Company in 1937 "greatly reduced accidents and led to lower labor turnover rates."<sup>10</sup> The National Safety Council has recently estimated that poor lighting is the direct cause of 5 per cent of all industrial accidents and a contributing cause in about 20 per cent of the cases.<sup>11</sup> All these reports point to the importance of proper lighting as a safety factor.

The quality and the distribution of light are as important as the amount. The very fact that the eye is so constructed that it can accommodate itself, even though slowly, to various intensities, provides a problem in itself. Everyone has experienced a temporary blindness in moving from a brightly lighted area into a darker area. Office workers, stock-room boys, or messengers may experience the same kind of blindness in moving about and fail to see the first step of the stairs or the janitor's cleaning pail. It is apparent, therefore, that sharp differences in light intensities should be avoided wherever possible.

The following table has been compiled from a more detailed one published in 1932 by the Women's Bureau of the United States Department of Labor, and shows the minimum foot-candles recommended for various industrial operations. In modern practice it has been found desirable to select values even beyond the upper portion of the range.

*Table 10. Recommended Levels of Illumination for Industrial Interiors\**

	<i>Foot-candles Recommended</i>
Aisles, stairways, passageways	5— 2
Assembling	
Rough	10— 5
Medium	20— 8
Fine	40—12
Automobile manufacturing	
Automatic screw machine	15—10
Tool-making	20—12
Finishing and inspecting bodies	100—25

\*Adapted from "State Requirements for Industrial Lighting." *Bulletin* 94, Women's Bureau, U. S. Department of Labor, 1932, and Recommendations of Illuminating Engineering Society.

Canning and preserving	20— 8
Cloth products:	
Cutting inspecting, sewing	
Light goods	20—10
Dark goods	100—25
Forge shops and welding	10— 6
Ice making	10— 6
Jewelry and watch manufacturing	100—25
Locker rooms	6— 4
Offices	
Close work	30—10
No close work	10— 8
Distribution of mail in post offices	20—10
Drafting room	30—15
Paint shops	
Dipping, spraying, firing	10— 5
Fine hand painting	35—10
Extra fine hand painting and finishing	100—25
Receiving and shipping	10— 4
Stone crushing and screening	10— 2
Sugar grading	30—15
Tobacco products	
Drying, stripping, general	3— 2
Grading and sorting	25—15

### *Highway Lighting*

There is some question as to the advisability of general highway illumination as a means of reducing auto accidents. Approximately 25 per cent of all highway fatalities occurring in rural areas involve either pedestrians or fixed objects.<sup>12</sup> It is argued by some that these obstacles can best be seen at night by equipping them with "cat's eye" reflectors rather than using expensive general illumination. On the other hand, it has been reported that highway illumination does reduce accidents. From July 1 to December 1, 1932, the Mount Vernon Highway just outside Washington, D. C., was well lighted and had an accident rate of 2.87 per million vehicles per mile. As an economy measure during the depression the lighting was suspended and the rate jumped to 7.02 for a comparable period: an increase of about 245 per cent.<sup>13</sup> Similar evidence comes from various cities, notably Detroit, Hartford, and Los Angeles, where reductions in night accidents varying from 46 to 93 per cent have been reported after modernization of street lighting.<sup>14</sup> At present there seems to be no information regarding the optimum amount of highway lighting for safety purposes. Cer-

tainly there is some merit in the suggestion that all obstacles be provided either with suitable reflectors or lights in preference to general illumination.

### *Ventilation*

A number of studies have shown the relation between accident frequency and atmospheric conditions, particularly temperature. In a munitions factory accidents were more frequent when the temperature was either moderately low (52° F.) or moderately high (77.5° F.). The lowest accident rate occurred in the presence of temperatures ranging from 62.5° F. to 72.5° F.<sup>15</sup>

Similar data were derived from a study of miners in eight English collieries whose accident records covered two two-year periods.<sup>16</sup> The following table is a partial summary of these data and indicates an increase in both the accident frequency and accident severity as the temperature increases.

*Table 11. Accident Rates of Miners in Relation to Temperature*

<i>Mean Temperature</i>	<i>Accident Frequency per Million Hours Worked</i>		<i>Accident Severity (Days Lost per 1000 Hours Worked)</i>	
	<i>1924-25</i>	<i>1927-28</i>	<i>1924-25</i>	<i>1927-28</i>
Coal-face workers				
63.9	104	133	3.5	4.4
77.3	144	144	3.6	3.8
80.8	184	173	4.5	4.8
Others underground				
62.0	58	57	1.8	1.8
72.7	87	81	2.4	2.4
78.5	100	92	2.3	2.6

A great many studies of ventilation such as those made by the Ventilation Commission of New York State have clearly demonstrated that conditions preventing normal heat loss from the surface of the body produce discomfort. As pointed out previously, high humidity and stagnant air, as well as high temperature, contribute to the smothering effect. Vernon has suggested that the reported severity index (the severity index is based on the amount of time lost per accident) of minor accidents in highly uncomfortable industries may be exaggerated or at least not directly

comparable to those reported from other more comfortable occupations. The supposition, supported by indirect evidence, assumes that injured workmen are influenced, by recollections of the conditions under which they worked, to remain at home drawing compensation for a somewhat longer period than they otherwise would if the work environment were more comfortable. Thus, the severity indexes of accidents may be unduly high in those occupations where humidity and temperature are high, even though the atmospheric conditions probably are not directly responsible for more severe accidents.

### *Speed of Movement*

So far as highway accidents are concerned, speed is the most frequent cause of all fatalities.<sup>17</sup> This means that the engineering development of the automobile has outstripped the average capacity to control it. The modern car has more speed and more power than the usual driver is capable of directing for the safety of himself and others. But what are the chief human limitations accounting for the high accident rate at excessive speed? What human factors make high speed unsafe?

First of all, it has been shown that as the speed of a car increases, the driver's field of clear vision narrows. Stationary objects on the sides of the road become a confused blur. The field of view is limited much as it would be by a tunnel. Moreover, the point of clearest vision is extended farther and farther ahead of the car as the speed increases.<sup>18</sup> Both these changes in the visual field are such as to blind the driver partially to moving obstacles coming into the path of the car from the sides of the road.

Second, excessive speeds also distort judgments of movement and distance which even at moderate speeds are highly variable.<sup>19</sup> Hamilton and Thurstone report a series of studies in which observers were placed in autos moving in opposite directions. Assistants in each car kept time records with stop watches to indicate the moment movement in the other car was first observed and the moment the cars passed each other. They found that when the cars were more than eight hundred feet apart, the oncoming car appeared to be standing still. When the cars were both moving at fifty miles per hour, only five or six seconds elapsed between per-



ceiving movement in the oncoming car and passing it. At twenty miles an hour the elapsed time was approximately twelve seconds. Within these brief time intervals it is necessary to estimate speed and distance if, for example, one is about to overtake and pass a slower vehicle. It also represents the maximum time provided to avoid a collision <sup>20</sup>

In the third place, studies of the lateral position of vehicles on a "straight, nearly level" stretch of road showed that the faster the movement the greater the tendency to encroach on the inside lane or center line. People fear more the hazard of the pavement edge than the hazard of using the wrong side of the road—this in spite of the fact that a collision with an oncoming vehicle is likely to be more destructive than a collision with a fixed obstacle off the road.<sup>21</sup>

These three factors—the squeezing of the field of vision, the necessity for making quick judgments of speed and distance, and the general tendency to hug the middle of the road—all contribute in explaining high accident rates at high speeds.

One should expect to find clear evidence of the influence of speed on accident rates in industrial activities. That is, as the rate of production increases in those plants where output rates are governed largely by human speed, one should expect the number of accidents per unit produced to increase. The existing field studies directed at this problem have not been clear-cut in their conclusions because of various complicating factors—notably fatigue, monotony, and worker attitude.

In an English factory engaged largely in drilling and lathe work, little relation was found between output and accident frequency except in the first three hours of the day shift, during which both factors increased. However, accidents were at their maximum during the first hour of the night shift when output was low. Throughout the night accidents decreased while production went through a normal cycle consisting of a slight rise to reach a near-maximum point about the third hour, which was maintained rather consistently until near the end of the work spell when production tapered off.<sup>22</sup> The investigators suggest that the effect of speed of movement on the accident rate has been masked by the worker's attitude and possibly by other factors.

Various laboratory studies have shown that accuracy of pursuit movements and aiming is clearly related to the speed with which the tasks are executed.<sup>23</sup> These studies under control conditions leave no doubt as to the validity of the common-sense conclusion that increasing the speed of movement will increase the frequency of accidents, other things being equal. In the industrial situations so far studied "other things" have not been equal. Unfortunately, there have been no investigations which would suggest the optimal speed of work which will give the maximum production with a minimum of accidents.

### *Machinery Accidents*

It was perhaps natural that attention should be directed first to the mechanical causes of accidents in the early years of the safety movement. Unguarded gears, grinding wheels, drive shafts, and belts were the most obvious hazards. The fact that safety engineers first attacked such conditions may be a reflection of the prevalent notion that the poor workman first blames his tools. Attention has not only been directed toward covering and guarding moving parts, but machinery is now being designed "from the floor up" with "built-in" safety. This is especially revealed in the case of automobiles, where many safety devices are provided as standard equipment and are kept in good repair by periodic inspections prescribed by some states. The mechanical perfection of autos is shown by the fact that in 1940 only about 6 per cent of all traffic accidents could be traced to mechanical defects.<sup>24</sup>

Even though campaigns have emphasized the necessity for proper mechanical safeguards, and factory inspectors enforce compliance with Federal and state regulations in this respect, industrial machines continue to rank as important hazards. Industrial accident reports from eight states for 1934 showed that machinery ranked first in causing injuries to women in two of those states. The percentage of machinery accidents for men ranged by states from 8.6 to 23.4 and for women from 14.6 to 35.6.<sup>25</sup> Data such as these suggest either of two tentative conclusions. First, in spite of remarkable improvement in mechanical safety devices during the past thirty-five years, many concerns may still profitably retool with a keener eye for safety. A second tentative conclusion is sug-

gested: namely, that perhaps mechanical safeguards have nearly reached their peak effectiveness in reducing accidents. Further decreases in the accident frequency may, therefore, have to depend upon a clear analysis of the personal factors contributing to the accidents and the development of appropriate protective measures.

Striking evidence in support of the second conclusion comes from the United States Steel Corporation, which discovered that 44.93 per cent of 100,708 accidents investigated occurred in hand labor where no mechanical safety device could be furnished.<sup>26</sup> Even where safeguards are provided there is no certainty that they will always be used. For example, an employee in a hurry to grind a small tool removed his fogged goggles just before the emery wheel threw a particle, destroying sight in one eye.

It is apparent, therefore, that the proper arrangement of environmental conditions can decrease the accident frequency to only a limited extent. This notion has been implicit in the previous discussion which indicated that the severity rate may be influenced by a particularly unfavorable attitude. Furthermore, the effect of increasing output on accident frequency was apparently obscured by cyclic changes in attitude during the work spell. There is plenty of evidence that such attitudinal factors influence accident rate.\* In the next section some of the important personal factors which influence the accident frequencies will be considered.

### 3. CAUSES OF ACCIDENTS—PERSONAL

Statistics of industrial accidents are not sufficiently complete to determine accurately the proportion of accidents attributable to personal factors. State and Federal labor departments, responsible for most of the industrial accident data, have been manned by engineers who have tended to view accidents as mechanical problems rather than as conflicts between erratic, variable, human behavior and the unvarying action of machinery.

\*Vernon points out that under the English Compensation Act, miners are compensated for nystagmus, a disease in which there is a rapid oscillation of the eyeballs. The number of such cases has risen from 460 in 1908, shortly after the Act became effective to 11,334 in 1925. In the United States where the disorder is not compensated it is practically unknown among miners.<sup>27</sup>

*Visual Defects*

A great deal of emphasis has been placed on the importance of good vision in avoiding accidents. Practically all states requiring an examination for a driver's license include some test of vision. This practice has gained widespread acceptance largely because it appears to be a test that would obviously be related to driving skill. Running contrary to this popular opinion are the findings of Weiss and Lauer, who discovered that among a group of unselected Ohio drivers (Ohio at the time had no licensing law for noncommercial drivers) visual acuity bore very little relation to the extent of accidents. The authors suggest that the drivers with relatively poor vision learn to compensate for their defect either through driving more slowly or by other means, thereby keeping their accident records as low as those with keener vision.<sup>28</sup> The existing evidence bearing on the relation between vision and highway accidents is at least meager in spite of the obvious desirability of having some information as to the importance of minor defects in the production of accidents.

One very extensive survey of an industrial plant employing more than 15,000 persons revealed a surprising correspondence between visual defects and the incidents of accidents. The findings of this survey are summarized in the following figure.

The figure shows that each of the defects examined was found more frequently in the accident group than in the plant taken as a whole. Assuming this study to be representative of industry in general, it points to the importance from a safety angle of establishing a system of periodic vision examinations and a program of visual rehabilitation.<sup>29</sup>

*Accident Proneness*

Peculiarly enough, the transportation industry has supplied a number of accident studies in which the human factors are emphasized. Outstanding among these are the investigations conducted by the Metropolitan Life Insurance Company, one of which was concerned with the frequency of taxicab accidents. This study showed that accidents were not distributed equally among 1294 drivers examined. Instead, the 10 per cent with the worst records

had 31.85 per cent of the accidents.<sup>80</sup> In other words, from the insurance standpoint there were a few drivers who were exceedingly poor accident risks since they were involved in a large percentage of the accidents, while other drivers presented virtually no risk at all. The former persons have been designated "accident prone." That is to say, persons who are implicated in a larger

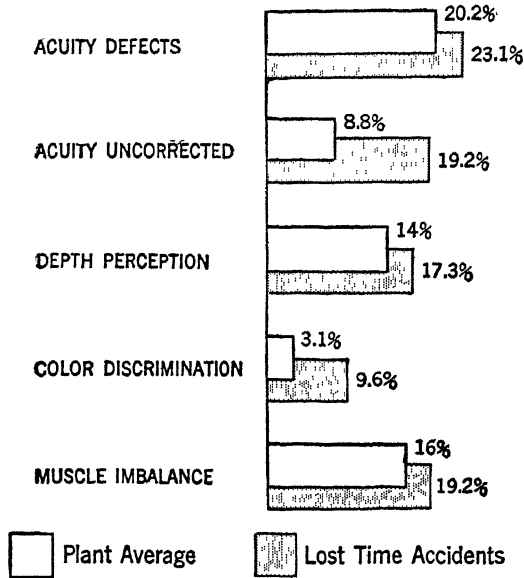


Figure 30. Percentage of Failures on Various Visual Performance Tests of a Group of Workers Who Lost Time from Accidents in 1939, Compared with Corresponding Percentages of a Cross Section of All Workers in the Same Plant. Adapted from H. S. Kuhn, "An Appraisal of Visual Defects in Industry," *Transact. Amer. Acad. Ophthal & Otolary*, n., June 1941, 9.

proportion of accidents than their associates who are subjected to the same hazards, are accident prone. Like other classifications of human characteristics, no sharp line separates the accident-prone individual from his fellows. Rather, there is a continuous gradation from one extreme where the individuals are highly prone to accidents, to the other extreme representing the persons who are rarely involved.

The findings of the Metropolitan Life Insurance Company have been verified by a number of studies, one of which concerned itself with a random selection of drivers licensed in Connecticut, for

whom complete records were available for the years 1931 to 1936. In addition to confirming the observation of a skewed distribution of accidents among drivers, these data suggest that it is possible to predict the accident experience of a group of drivers on the basis of their past driving performance. Drivers were first separated into groups according to their accident records in the years 1931-1933. The accident frequency for each of these groups was then computed for the years 1934-1936. The results are given in the following table.\*

*Table 12. Accident Rate in Two Successive Periods of Three Years Each*

<i>Accident Groups 1931-33; Accidents per Driver</i>	<i>Same Groups 1934-36; Accidents per Driver</i>	<i>Relative Susceptibility</i>
0	0 101	1 00
1	0 199	1 97
2	0 300	2 97
3	0 484	4 79
4	0.700	6 93

It can be seen that those who had four accidents in 1931-1933 were involved in nearly seven times the number of accidents in 1934-1936 as those in the original "no accident" group. Further study of the data revealed that accident repeaters tend to shorten the time between collisions as their accidents accumulate. The fourth accident tends to follow the third more closely than the third followed the second. For several months immediately following a collision, the operator is more liable to accidents than he was before or will be later.<sup>31</sup>

Accident proneness is not unique to highways as shown by a recent report of accidents in a steel mill employing about nine thousand workers. These men were first separated into groups having 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 visits to the plant hospital during 1938. The average number of hospital visits in 1939 for each of the groups was then computed giving the following figure. It is obvious that those having the largest number of accidents in 1938 were the most frequent repeaters in 1939. A further breakdown of the data showed that the same general relationship held for men within a given department subjected to identical hazards.

\*This study does not make a clear proof for the existence of accident proneness in its own right, since no attempt was made to equate the mileage of these motorists or in any way equate their exposure to road and traffic hazards.

Ever since accident proneness was first pointed out by Greenwood and Woods,<sup>32</sup> a search has been in progress for tests that would identify accident-prone persons in advance of employment. Attempts in this direction have not been wholly successful. A great number of tests have been constructed for auto drivers including tests of simple and choice reaction times, steering and

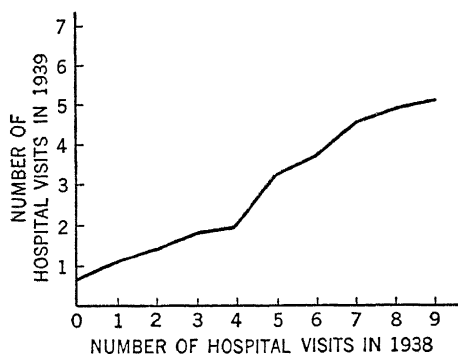


Figure 31. Showing Relation Between Number of Hospital Visits for Two Successive Years Among Approximately 9,000 Steel Workers From J. Tiffin, *Industrial Psychology*, Prentice Hall, 1942, 286.

braking vigilance, estimation of speed and distance, sensitivity to glare and visual acuity. None of these correlates highly with accident records, in spite of popular notions to the contrary. Farmer and Chambers, who have worked most persistently on the problem, developed a battery of tests, including dotting, reaction time, pursuit movements, coordination, and steadiness tests. Raw scores on these tests were weighted and combined to give an aestheto-kinetic score which has been correlated with accident records in various work groups. Such correlation coefficients for the most part have been less than .30.<sup>33</sup> The evidence seems to indicate that only extreme scores are related to the accident rate.

Attention has also been directed toward a description of those personal characteristics which are frequently associated with the accident-prone individual and which are assumed to be the cause of the accidents. Another study by the Metropolitan Life Insurance Company, this time involving fifty accident-prone motormen of the Cleveland Railway Company, showed the primary cause of 70 per cent of their accidents to be one of the following psychological factors: faulty attitude, failure to recognize potential hazards, faulty judgment of speed or distance, impulsiveness, irresponsibil-

ity, failure to keep attention constant, nervousness, and fear. Physical factors such as defective vision, high blood pressure, or other organic diseases were the primary cause in only 10 per cent of the accidents. This and other studies of similar nature have demonstrated that whatever else he is, the accident-prone person is not necessarily physically handicapped with respect to his job.

### *Faulty Attitudes*

In the above paragraph, faulty attitudes were listed as one of the primary causes of accidents among the accident-prone motormen. What does such a classification include? What are some of the faulty attitudes which may be presumed to be the cause of accidents?

The spirit of adventure found in most normal boys may be easily translated into "take a chance" when these same boys as young men begin work in the textile mill or on the assembly line. In an effort to demonstrate their nascent adulthood youthful workers are perhaps more likely to accept hazards, thinking that they can thereby gain the admiration of more experienced men. A spirit of bravado, swaggering indifference, or excessive self-confidence very likely contributes heavily to the high accident frequency of new and inexperienced workers.

Only a few accident surveys throw light on the influence of particular attitudes. This lack of information is partly attributable to the difficulties encountered in objectifying ratings or measures of attitudes themselves. Representative of the studies that have been reported is that of the Boston Elevated Railways, which showed that 39 per cent of the high-accident men were rated as "uncooperative," as against 5 per cent of the low-accident men.<sup>34</sup> Uncooperativeness with supervisors or associates apparently was indirectly responsible for at least some of the collisions incurred.

Preoccupation with domestic or occupational problems is another attitude frequently the cause of a high accident rate. A worker, for example, had had one or two arguments with the time clerk about his card. When the pay envelopes were distributed by the clerk, the worker found less than he had expected; he left his machine, determined "to have it out with that—clerk or else." In his hurry to catch the clerk before he left the section, the work-



man tripped over a piece of pipe and fractured his arm \* A motor-man with a good record began to have a "streak of bad luck." Investigation disclosed that he had recently lost his wife and was worried about the discipline of his several children, all of school age, who depended upon him to cook meals and clean the house. After he was induced to hire a housekeeper his accident record improved.<sup>35</sup>

Many persons are likely to think of the accident-prone worker as merely careless. In a sense, such a description is not far wrong. However, safety engineers, personnel managers, and insurance companies are interested in discovering what makes a man careless. Merely dubbing a man careless gives no hint as to the best method of correcting his defect. On the other hand, if contributing factors can be plotted or enumerated, such as those mentioned above, often a remedial program suggests itself.

### *Ignorance, Lack of Skill*

A number of studies have clearly demonstrated a close relationship between inexperience, ignorance, or lack of skill and the accident rate. Among women press operators in the metal trades the accident index dropped from 329 on the first day of work to 0.47 after seven months of experience.<sup>36</sup> Similar information comes from an examination of mining accidents, 21 per cent of which occurred during the first week of employment and 48 per cent in the first two months.<sup>37</sup> Fisher reports an unpublished study from the Carnegie Steel Company, Youngstown Sheet and Tube Company, International Harvester Company, Fairbanks Morse, and several others, showing that new employees of less than one month's service were six times as liable to injury as those at work over one month.<sup>38</sup>

It is perhaps not surprising that lack of experience or skill in use of tools should be an important factor in accidents. Startling has been the discovery that language skill may also affect accident figures. Dallas, Texas, found Mexicans were suffering twice as many pedestrian deaths as might be expected from their numbers. Public instruction in their own language cut fatalities in one year

\*Such an accident illustrates the difficulties in compiling accident statistics. Was the accident due to the misplaced pipe, inadequate illumination, or mental attitude? Preoccupation with the pay envelope undoubtedly was one contributing factor

by 58 per cent.<sup>39</sup> Apparently much of the safety literature written in English was incomprehensible. Accident records covering eight years in a large steel mill showed that non-English speaking workers had a frequency rate 2.3 times that of American born men.<sup>40</sup>

If it is assumed that the high-accident frequency of non-English speaking persons is largely explicable in terms of their inability to understand posters, warning signs, and other forms of safety literature, then the above reports carry a second important implication. They indicate roughly the effectiveness of such devices in reducing accidents. The temptation of many executives to consider such material as ineffective and trite should obviously be avoided, although one may question the adequacy or preventive value of certain specific devices that may have been overworked.

### *Intelligence*

A number of reports suggest that intelligence may play some part in determining the frequency of accidents. Lauer found that drivers with I.Q.'s below 75 and between 110 and 125 were more likely to have accidents than other people.<sup>41</sup> Examinations of five hundred traffic violators referred by traffic-court judges to the psychopathic clinic of the Detroit Recorder's Court showed that 69 per cent were below average intelligence. This, however, was a selected group and should not be considered typical of all traffic violators.<sup>42</sup> Farmer, Chambers and Kirk obtained one of their highest correlations (.314) between linguistic intelligence and accidents in a small but random group of engine fitters.<sup>43</sup> All of these reports suggest that intelligence is a factor in the production of accidents although the relation is not very close. Perhaps intelligence operates indirectly, and consequently its influence on the accident rate is masked by other factors. It is known, for instance, that skill on the job is an important determiner of accidents. However, the speed with which one progresses through the relatively hazardous learning period is partly but not entirely affected by intelligence. Thus the influence of intelligence is obscured somewhat by other factors affecting skill or the quickness with which one learns the job.

Lauer's results can be explained in somewhat different terms. In highway accidents it is the atypical driver who is frequently a

cause. It is not so much the absolute speed with which cars travel that is important, but rather the speed of a few who drive faster or slower than the major part of the traffic. Accidentless driving often calls for cooperation between drivers and correctly anticipating the actions of others. It is conceivable that members of a fairly homogeneous group would be more successful in correctly foreseeing each other's actions than those who differed significantly from the average, regardless of whether they were superior or inferior. Thus, both the highly intelligent and the dullards would be more likely to have accidents than the average.

#### 4. ACCIDENT PREVENTION

Having reviewed the causes of accidents the next step is to consider what may be done practically to reduce accident frequencies. A complete safety program seems to be divided into three aspects: (1) mechanical safeguards and working conditions; (2) identification of accident proneness; and (3) safety education.

##### *Mechanical Safeguards and Working Conditions*

The studies cited earlier in this chapter give clear evidence that lighting and temperature control are related in accident frequency. Presumably, if these conditions are kept within the recommended limits accidents will be less likely to occur.

A good part of the improvement in the nation's industrial-accident record during the early years of the safety movement is apparently due to the development of guards for exposed moving parts. Obviously, such engineering developments which are directed to this end are to be encouraged, particularly when machinery is designed so that the safety devices are integral parts and not merely "de luxe accessories" which some economy-minded purchasing agent may consider unnecessary.

As previously pointed out, optimal working conditions from the safety standpoint and the best guarded machinery provide no complete insurance against accidents. Failure to use safety devices accounted for 8 per cent of all occupational injuries within Pennsylvania in 1940. Additional measures must be instituted.

Numerous suggestions have been offered and some applied concerning highway construction as a means of reducing accidents.

Dangerous three-lane highways have given way to four-lane roads with a dividing grass strip down the center. Studies have been made of the legibility, visibility, and proper placement of warning signs. Moreover, several models of traffic lights have been designed, giving the motorist some indication of the amount of time left before the green will shift to red or yellow, thereby enabling the motorist to judge the advisability of attempting to "beat the light." However, these newer lights have failed to gain much acceptance. The elimination of grade crossings, blind curves, and other road hazards continues to hold the attention of highway engineers.

The design of automobiles has also been influenced by safety considerations. Efforts have been made to increase the driver's field of vision through enlarging the windshield area, and tapering the hood and front fenders. A great deal of research has gone into the problem of headlights in order to reduce glare without sacrificing brilliance. One suggestion to this end has been to place the lights much above or below the eye level of oncoming drivers. Auto designers apparently have not been able to work out a pleasing contour for lights situated above the windshield, while hilly roads would seriously limit the length of the beam if lights were placed much lower than is customary at present.

As a means of making speedometer readings more meaningful a number of novel designs have been suggested, such as the one

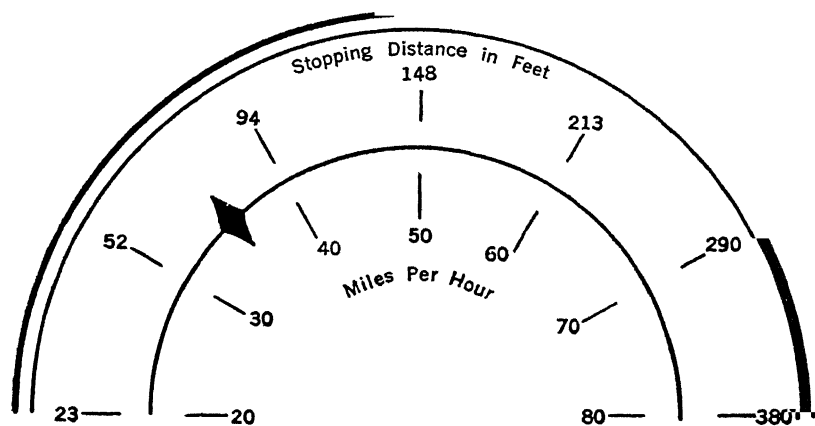


Figure 32. Showing Speedometer Dial with Normal Stopping Distance.

shown in Fig. 32, which gives not only the miles per hour but the average stopping distance provided the road is dry and the brakes are in good condition.

Such a dial face would continually remind the motorist of his necessary margin of safety and probably induce him to exercise due care at high speeds.

### *Identification of Accident Proneness*

The discovery that accidents did not distribute themselves by chance among large groups of employees subjected to the same hazards, has led to a search for tests that will identify the accident-prone person. To date this search has been rather disappointing. Such tests have not been used extensively although the approach is a reasonable one which should prove productive.

In this connection it may be well to remember that numerous test batteries have been devised for selecting employees for particular jobs such as streetcar motormen and electrical substation operators. In some of these cases the criterion with which test performance was correlated was some measure of "operating errors." In one sense these errors constitute accidents, and indeed may actually cause injury to persons or property. On the other hand, such errors are more directly comparable to those mistakes of an employee which result in spoiled material or reduction in output. Moreover, since Newbold<sup>44</sup> has shown that accidents sustained on the job are correlated with accidents suffered at home, the current employment tests validated against accidents must be shown to correlate with home accidents before they can be accepted as tests of accident proneness. Quite properly they are selection tests for jobs where the measure of job success is in terms of operating accuracy. At present, there is no basis for concluding that these tests identify accident-prone people.

The survey of Connecticut drivers already referred to, as well as others, have suggested that the most obvious way of identifying accident-prone persons is through their accident records. One company operating a fleet of trucks cut the number of its accidents per year about 80 per cent by progressively eliminating the drivers who had the worst accident records. Prior to 1930 this company suffered about two hundred accidents per year. At that time they

began weeding out drivers with high accident records who failed to respond to retraining. In the next five years they dropped about 12 per cent of their drivers, rehiring others to take their places. Accidents decreased from 207 in 1929 to 47 in 1935 without any substantial drop in the number of miles traveled.<sup>45</sup>

### *Safety Education—En Masse*

Safety education can be conveniently divided into two kinds: broadside appeals and individual instruction. Let us consider the first of these.

By broadside appeals is meant the use of posters, warning signs, pamphlets, safety exhibits, and other devices which are designed to cover all members of the organization. The extent to which such devices are effective is hard to demonstrate since undoubtedly a great many factors determine the net preventive power, such as the pictorial interest of the posters, their color, placement, size, amount, and the character of the written appeal. Data presented in a previous section showed roughly the general effectiveness of these devices (page 310). The principles which govern the effectiveness of visual safety literature are essentially those which apply also to advertising and selling. Here the problem is to "sell safety" to employees.

Many striking safety posters have made liberal use of negative appeal, that is, a vivid presentation of a condition so unpleasant and painful that those who see or read the literature will be driven to avoid the danger. One familiar example of negative appeal is found in mouth-wash advertisements condemning halitosis, in which measures for avoiding the unpleasant conditions are described.

Such appeals are not always recommended for regular advertising except with particular commodities. Negative appeal, however, seems to be readily adaptable to most safety "advertising." One familiar example of negative appeal in safety education appeared in posters placed near railroad crossings, showing a fast moving train bearing down upon an automobile filled with a horror-stricken family.

Large colored posters prominently displayed in the vicinity of hazards have the advantage of attracting attention to the danger

at about the time and place where it is most likely. It is important to sell the safety message. As an example, a sign in one of the American Rolling Mills' carpenter shops read, "Remove your gloves when operating this machine." Later the sign was changed to, "Save your hands and your family's income by removing your gloves when operating this machine." Many of the posters throughout one of this company's plants were changed in this way to emphasize the personal benefits of safety. Following the changes the accident frequency dropped 50 per cent.<sup>46</sup>

Other broadside devices include the appointment of safety committees in each department and the publication of department accident records with honor awards for individuals or gangs with the lowest frequency. The men on the safety committees are often those with good records who are the leaders of their groups. Their duties are informal and loosely defined but usually consist of simply talking safety and reminding their fellows not to take chances.

Exhibits of various types are sometimes effective. One plant displayed a human finger in a preservative solution with a note that the amputation was necessary because the worker had failed to have a minor cut dressed before it became infected. On another occasion an eye was displayed with the simple statement, "He didn't wear goggles."

Much safety education of a general kind can be done during the period of job training. It is easier to instil safety habits when a man is learning a job than to reeducate him after he has acquired a number of dangerous habits. There is no certainty that if left to his own devices the novice will automatically or naturally drop into the desired patterns of action. On the contrary, he is most likely to do the opposite. Consider, for instance, a conscientious employee who has just been hired and is anxious to show his ability by quickly learning the job. Frequently, such a man has "learned" the job when he turns out the standard number of units. He is thereby encouraged to gain in speed from the start. Unless deliberately trained, his procedure, motions, methods of work, will be hurried and wasteful of energy. Partly because of the extra fatigue, partly because of inexperience, and partly because of his attitude of hurry, he is more susceptible to accidents. If he persists in using the inef-

ficient methods of work that force him to hurry in order to meet standard production, his added experience will not markedly decrease his accident hazard. The safety preventive in this case is obviously to insist upon those work habits in the training period which enable the individual to meet the production standard without careless rush.

Allied to all of these measures is the "safety inventory" designed ostensibly to take stock of what safety work is being done in an organization. One branch of the Westinghouse Electric Company has used such an inventory since 1937, asking foremen, department heads, benchworkers, sweepers, and others about current practices and also getting suggestions for new safety precautions. In this manner safety is brought to the attention of workers in a way that actively enlists their cooperation.<sup>47</sup> In addition, the inventory is a stimulus to use what safety devices have been provided by the management.

### *The Clinical Approach*

In addition to educational measures designed to deal with workers *en masse*, efforts are being extended to correct dangerous habit patterns of individuals. This procedure calls for a careful analysis and diagnosis of each particular workman with a poor safety record. A careful examination of one bus driver's record revealed a large number of rear-end collisions. Further study showed that a high proportion of these were damaging to the left rear corner of the bus. The driver was interviewed and could give no satisfactory explanation. An observer was placed on his bus and discovered that, *probably out of consideration for the traffic behind the bus*, the driver tended to cruise near the curb until he reached a parked car and then turned sharply out into the regular line of traffic. Thus cars behind the bus were given insufficient warning. It is to be noted that in this case the driver's intentions were good but his driving habits were different from those expected of him. The case cited on page 310, in which the motorman's high accident record was attributed to preoccupation with domestic difficulties, was unraveled and rectified by a similar process of individual analysis. Similarly, a lathe operator in an effort to compensate for excessive time consumed in setting up the raw stock and removing the fin-



ished piece, set his cutting tool too deep. The result was excessive waste in spoiled materials and a large number of minor injuries to himself. In this case, efforts to make up for inefficiency in one part of the job contributed to further inefficiency and more accidents.

In an effort to reduce traffic accidents among drivers in general, some cities have followed procedures somewhat like that adopted by the Wichita police. In this city, drivers receiving two warnings for moving traffic violations within any twelve-month period are automatically called to a traffic clinic for interview. A battery of tests is administered and the officers endeavor to discover, with the violator's cooperation, the driver's abilities and limitations. Suggestions are given for correcting whatever driving defects are uncovered. Undoubtedly, the success of such a plan depends upon the extent to which the driver's interest is aroused in reducing his accident tendencies.<sup>48</sup>

The reeducation of individual workers becomes a relatively easy matter after the essential cause in each case is discovered. It is to be noted that no general survey of accidents would have revealed the causes in the above examples. They are individual matters which can only be uncovered through the rather costly clinical approach involving a separate investigation and close study of each particular employee. Only those employees who have rather high accident records usually come under such careful examination. However, since these are the workers who generally contribute most heavily to the accident record of an organization, a relatively few such individual studies may reduce the company's record markedly.

### *Safety Education for Pedestrians*

Up to this point little has been said about pedestrians, in spite of the fact that they are represented in three out of five highway fatalities. No one has studied pedestrians, their habits, attitudes, and behavior with the same care that industrial workers and motorists have been examined. For the most part, psychologists and others interested in the accident problem have been content to count the pedestrians killed and injured each year and let the mute figures speak for themselves. Unfortunately, the figures have generally remained mute.

It may be rather startling to discover that two out of every three pedestrians killed by motor vehicles were either violating a traffic law or acting in an obviously unsafe manner. The abandon and lack of caution with which many pedestrians use the highways and streets is to a large measure responsible for their deaths. Until recently little effort was made to enforce traffic regulations on those who walk, but in increasing numbers cities are beginning to arrest and fine not only the motorist who runs through the red light, but the pedestrian who takes similar chances. In cities where such enforcement has been used, pedestrian accidents have been reduced as much as 45 per cent within a year's time. It is quite evident that walkers ought to be subject to traffic regulations just as motorists, and ought to accept the restrictions with the same attitude as the man behind the wheel.

Seattle police discovered a bit of important information about humans that proved helpful in controlling pedestrian traffic. The police noticed that traffic lights were obeyed fairly well, provided the waiting time was not longer than eighteen seconds. After that the average pedestrian would become impatient and start to cross, light or no light. As a result of this finding, the traffic lights were timed so that rarely is a pedestrian forced to wait beyond this "average patience" time.<sup>49</sup> Similar control studies might well be attempted in other cities to adjust the timing of lights to the temperament of the population.

It has been argued that mass education of pedestrians will solve most of the problems. In support of this contention it is pointed out that the casualties among school children on the streets have progressively decreased—something like 30 per cent in the past sixteen years.<sup>50</sup> These are the walkers who have been exposed to safety education at fairly frequent intervals in school. On the other hand, the fatalities among older age groups have increased in the same period of time from 20 to as high as 126 per cent. Pamphlets, newspaper articles, and radio appeals directed at adult pedestrians would probably bring about some improvement in their accident rates.

However, before such education can be maximally effective it will be necessary to survey the conditions and attitudes which contribute most to pedestrian accidents. More studies are needed

of the special limitations of walkers, similar to those of the special limitations of drivers. It may develop that some broad avenues are simply too wide and too busy for the average person to cross with safety unless he leaves the curb at the moment the light changes in his favor. Warning signs advertising this fact might be posted, or safety islands might be established at such intersections. Until such surveys are made, pedestrian safety education must be on a shotgun basis, directed at all the possible contributing factors in the hope that the important and essential factors will be touched.

## 5. SUMMARY

The discussion of accidents has pointed out the enormous economic waste entailed. An analysis of the impersonal causes of accidents shows that considerations of illumination, ventilation, mechanical guards, and speed of action are relevant. The precise degree to which each of these factors contributes to accident frequency has not been determined accurately at present. Probably one of the factors contributing to this uncertainty is the virtual impossibility of subjecting the accident problem to expensive laboratory experimentation where all contributing factors are systematically varied. The field investigations nevertheless suggest that human factors are at least as important as the impersonal causes. The discovery of a skewed distribution of accidents among workers subjected to the same hazards has eased the problem of accident prevention to some extent. Efforts need merely be concentrated upon a small proportion of workers in order to reduce accident frequency to a marked degree. Some of the personal factors that appear to be related to accidents are faulty attitudes, preoccupations, lack of skill, and language handicaps. In addition to the use of all available mechanical means of eliminating hazards, two other approaches have been made to accident prevention. The first of these, prior identification of accident-prone people through tests, has not been particularly successful. Safety education has been perhaps more effective. A recent development in this connection has been the clinical examination and diagnosis of individual accident-prone persons, followed by retraining to eliminate the accident-producing habits.

4. PSYCHOLOGY APPLIED  
*to Consumers and Advertising*



# Chapter 12

## CONSUMER AND ADVERTISING RESEARCH

Consumer research is the newest important development in the complex organization of manufacturing and distributing concerns. Its precise origin is lost in vague fetal stirrings during the years just preceding 1920. Slowly developing into an infant science during the postwar years it struck a period of accelerated growth during the depression of the early thirties, when it became painfully evident that many concerns were manufacturing goods which few people wanted. Advertising departments were hard pressed to devise new ways of convincing consumers that the goods on store shelves should be in their homes. Both overproduction and the effort to increase consumption through advertising focused attention on consumers as objects of study. What do they want? Who and where are they? How can they be persuaded? How can they be reached? Gaining the answers to these and similar questions has been the task of consumer research.

This chapter will first consider the effects of consumer studies on the designing, advertising, and selling departments. Later it will discuss the precise problems with which consumer research is concerned and the techniques employed to solve these problems. Finally, since buying actions are presumably influenced by advertising, the last section of the chapter will be devoted to a description of the testing methods employed in this field.

### 1. INTRODUCTION

A decade or so ago the production of most consumers' goods was largely dictated by engineering considerations. When a manufacturer decided the time was ripe for introducing a new shaving cream, a "ready-mixed" cake flour, or a lightweight tractor, he

called in his chemists and engineers to plan the project. They designed the new product, determined the cost, added a percentage for profit, and thus arrived at the selling price. In the course of this preliminary work they might make a few tests of their new product. The chemist and his friends might try out samples of the shaving cream or the cake flour might be used in the company's cafeteria kitchen. The tractor was usually tested on the company's "proving grounds" to determine factors such as fuel consumption, speed under various loads, endurance, and wear. If the reports from these tests were favorable, the product usually went into "production"; that is, quantities were turned out by the manufacturer's plants and an advertising campaign was instituted. The process of introducing a new product was largely an engineering matter with only a passing glance at consumer needs, preferences, likes, and dislikes.

All too frequently the process remains the same today. However, an increasing number of progressive concerns have reversed the order of events. Instead of starting with engineering plans and specifications, they start with the consumer, determining his preferences, complaints about existing products, purchasing habits, and other characteristics that in the last analysis determine public acceptance. This change in outlook does not mean that the engineer is no longer of importance. Rather it means that the engineer is provided with a reasonably clear set of consumer specifications that he must meet. For instance, the latch on the early electric refrigerators must be pushed downward before the door can be pulled open. On many recent models the housewife merely pulls and the door is unlatched and opened in one motion. One latch is just as good as the other from an engineering standpoint—each holds the door shut. From the standpoint of consumer convenience the difference is important. Consumer studies are frequently aimed at discovering which of the equally good engineering devices is high in buyers' preference.

The introduction of consumer research has not only affected the designing, planning, and production departments of modern industry; it has also had a profound influence on selling and advertising. Under the older system the essential job of selling and advertising was to break down "resistance." Implicit in this notion was the

idea that the consumer frequently did not want what had been produced—an idea that was too often true. The industrial manager seemed to have something that approached a Messiah complex. He and his staff had produced an article of worth. If the public could not see its worth immediately the sales and advertising departments had to convert the public to a new set of beliefs. If the article did not sell, something was wrong with the sales and advertising efforts. It rarely occurred to the manager that his first premise might be wrong; the article might not be what the public wanted or might not satisfy adequately the consumer's needs. The change in procedure wrought by consumer research has lifted from advertising some unjust criticism but in turn has redefined the objectives of selling and promotional campaigns.

The purpose then of consumer research is to discover what people will buy; how and where they will buy it. Set in broader perspective, consumer research aims to discover the customer's preference, buying habits, and other determiners of purchases so that the designer, advertising copy writer, and salesman may adapt their efforts to the consumer.

Following are the specific objectives of certain consumer-research projects, the techniques for attaining those objectives, the psychological principles involved, and some of the most important precautions that must be exercised in executing and interpreting research of this kind.

## 2. OBJECTIVES OF CONSUMER RESEARCH

### *Attributes of an Article Important to the Buyer*

When electric clocks were first introduced to the general public about 1926, the selling and advertising literature emphasized their accuracy.<sup>1</sup> The engineers who had designed and produced the clocks were apparently enthusiastic about the *synchronous motor*, the *master clock in the generator plant*, and the *constancy of generator speeds*. The promotional campaign caught up these phrases and paraded them before a mildly interested but overawed public who understood little of the electrical jargon. The Market Survey Division of the Psychological Corporation conducted an informal study to discover what aspects of electric clocks were liked by those who



owned them. Nonowners were also studied to discover the essential irritations resulting from dependence upon old-fashioned clocks. The satisfactions derived by the owners of electric clocks consisted largely of relief from the necessity of winding and rewinding. Dovetailing with this was the finding that the nonowners were chiefly annoyed by inaccurate time resulting from failure to wind their clocks or setting the clocks by guess.

The essential point in this example is the fact that the manufacturers and advertisers of electric clocks were obviously stressing an engineering feature unrelated to the principal convenience supplied by their product. The engineers, blinded by the brilliance of their electrical achievement, were unable to look at the electric clock from the standpoint of the usual customer who knows nothing about alternating currents except that they are shocking.

In this example we have illustrated the first objective of consumer studies, namely, *the determination of those attributes of an article that are liked or used, and those attributes which are disliked or not used by the consumers*. The dodads or the "gingerbread" of a product in the eyes of the engineer, designer, or advertising consultant may be the all-important considerations for the consumer. The vagaries of the general consuming public cannot be discovered reliably by judging one's own impulses or even those of a small circumscribed group of acquaintances and associates. Knowledge of what the consumer wants or demands of a product can only be discovered by careful and systematic investigation of consumers themselves.

A second example showing the value of discovering what people want is found in the story of Spry, a vegetable fat for cooking. In the pre-Spry years the principal brand in this field was Crisco. The first step was to discover what people did not like about Crisco. A survey showed that housewives complained about soiled and torn paper wrappers around the can; the Crisco was often unevenly packed; it grew rancid at times if left on the pantry shelf, and was too stiff if kept in the refrigerator. Other customers objected to the lack of uniformity in color, consistency, and flavor. To counterbalance these real or imagined defects it fulfilled its purpose better than any other existing shortening. It was well advertised, reasonably priced, and distributed throughout the country.

Armed with the knowledge of what consumers disliked, the makers of Spry developed a shortening that was snow-white, tasteless, would not grow rancid even in an open can on the pantry shelf, and was neatly packed in a container without a paper wrapper. The phenomenal success of Spry (gross sales in 1937 about \$12,000,000) is to a large extent attributable to the preliminary study of what the buying public wanted.

Another recent example of the effectiveness of consumer studies of this sort is found in Teel, Procter and Gamble's liquid dentifrice. Every characteristic of this product was dictated by surveys of consumer preferences—the viscosity, color, and taste. However, in this case a further step was taken. After Teel was "tailor cut" to fit consumer preferences, a staff of interviewers set out with a kit of dentifrices to ring doorbells and inquire, "What dentifrice do you use?" If the answer was Colgate's, the interviewer would produce a tube of Colgate's ribbon tooth paste with the brand name removed and invite the respondent to try the paste for one week; then try "this liquid dentifrice" for the second week. Two weeks later the interviewer would call again and ask which dentifrice had been preferred. The results justified the mass production and distribution of Teel. Within a short time after its introduction Teel was a successful member of the Procter and Gamble line, thanks to the consumer research of the previous two years.

In some consumer studies it is desirable to determine exactly who uses the product as well as how the commodity is employed. Such information is often of aid in suggesting to a manufacturer how he can better adapt his commodity to the real job that it will be called upon to perform. One producer of flashlight batteries was interested in discovering what member of the family used the flashlight most; where the light was stored when not in use; how often cells had to be replaced; specifically how the family flashlight was used (in looking after the cows and horses in the barn, night fishing, examining the water level in the automobile battery, and so on). Such information, if secured from a representative cross section of the potential buyers of flashlight cells, can be of much value to the producer either in correcting slight deficiencies in his standard product or in developing special batteries for special purposes. The manufacturer, the designer, the sales and advertising manager

need to know what features of the article consumers like and dislike.

### *Characteristics of the Buyer*

A second group of problems is often presented by a consumer survey in addition to those just discussed. These new problems are concerned with *the discovery of those factors within the individual that affect his purchase of the specific article in question or competing articles*. Such questions as the following are pertinent: Who buys it? (Husband, wife, son, daughter.) Is the decision made quickly or after a long period of deliberation? For instance in the case of radios, does the buyer usually decide upon a given make and then select his model from those presented by the manufacturer, or vice versa? What are the "prime movers" in customers buying the product and competing products?

This last question sets off the distinction between the views of earlier psychologists from those who have adopted a newer outlook. In the early 1920's and before, psychologists of advertising discussed with apparent finality and certainty the motives, instincts, and drives that impelled men to buy Weed's tire chains, Paris garters, and Overland autos. Lists of basic motives were proposed, which, if properly stimulated, would presumably cause buyers to beat a path through the woods of competing brands to the door of the advertiser regardless of his wares. The desire for self-preservation, sex drives, the desire for financial security and popularity were some of the keys by which the manufacturer was supposed to be able to unlock the purses of sales-resistant customers. If these drives were tied to aluminum ware, shoes, or hair nets the sales were expected to mount.

Gradually advertisers and psychologists alike abandoned attempts to find the master keys to consumers' purchasing power. Instead, efforts in more recent times have been directed toward discovering what specific set of factors within the individual impel him to purchase a particular article of a given brand. The attempt to short-cut that problem in the earlier studies has proved illusory. For example, the appeal to health has proved of considerable value in promoting the sales of cod-liver oil but the sales of Life Buoy Soap remained at a moderately low level until it dropped its

health appeal for blatant B. O Appeals to fashion, vanity, thrift, security, safety, or popularity that prove to be the dominant determiners of purchases for one commodity are not necessarily important in other commodities. It is the purpose of some consumer studies to discover which are important for a given article.

Discovering the buying habits of customers is one of the important problems frequently included under the head of factors within the individual that determine purchases. A great number of sales are made largely through habit. A brand of coffee or cigarettes, shaving cream or beans may satisfy our tastes so that we fall into the habit of asking for such commodities by brand names without each time reconsidering the relative merits of competing brands. Many people continue to buy at particular grocery stores or filling stations in spite of the occasional poor service that would induce less habituated customers to buy elsewhere. An oil company wanted to know whether motorists purchased their oil more or less as a matter of routine at the same station that they purchased their preferred brand of gasoline. If that were the case, then it would be more important to stress the virtues of the gasoline in their advertising. On the other hand, if the selection of oil governed the choice of gasoline, the emphasis in the advertising might more profitably be placed on the lubricant. The survey of consumers on this point revealed that sometimes the lubricant governed the choice and sometimes it was the gasoline, which meant that the producer could not afford to neglect either his oil or gasoline advertising at the expense of the other.<sup>2</sup> Another example illustrating the importance of buyer's habits is found in the department-store manager who placed small tables of candy at various points in his store to discover where candy sold best. He was able after a time to locate his candy department at that point where his customers were most likely to buy. Modern merchandising demands that knowledge of the consumer's impulses, habits, desires, wants, and motives affecting the purchase of particular articles be available.

### *"Extraneous" Factors Determining Purchases*

A third group of problems centers around the determination of those factors outside the individual and extraneous to the com-

modity that determine purchases. It is at this point that many consumer studies become interested in the effectiveness of advertising. Does the advertising of pharmaceutical drugs increase their sales or do such purchases depend more upon the advice of one's physician? Are the recommendations of neighbors more important than the advertised testimonials of Hollywood stars in buying an automobile? To what extent does the package, its color, size, or shape, influence buying? Where does the advertising of the product exert its greatest effect? On the radio? In the newspapers? On the billboards? How effectively is a given advertising series getting over its message to the potential buyers? What are the "unimportant" trifles that swing sales from one brand to another?

The General Motors customer research staff has been collecting since 1933 a great number of instances showing that after a buyer has shifted his choice down to a couple of cars which are about the same in basic characteristics he is likely to be swayed by a few minor details. The decisive trifles in one case were, "long hood, deep tone of horn, feel of the steering wheel, attractive radiator ornament." In another the important factors were "a door handle, an oversized speedometer face, a large gas tank and a wide rear door."<sup>3</sup> These features are largely the "gingerbread" trimming, comparable to the wrapping paper on a package. They contribute little or nothing to the efficient running of the car, its longevity, or its economy. Yet such small details prove to be tremendously effective in promoting sales. The study of extraneous factors influencing buying behavior has demonstrated the necessity of being fussy about the minor characteristics of one's article.

The three objectives of consumer studies just discussed are not mutually exclusive. Their classification has been only for convenience of discussion. In any given consumer study these objectives frequently overlap. A study of the attributes of an article that consumers use or like frequently entails an analysis of consumer habits as was the case with the electric clocks. Moreover, the effectiveness of advertising viewed either from the angle of content or media likewise often depends upon the potential buyer's

\*One bottling company changed its carbonated water from a plain green bottle, such as was used for years for their ginger ale, to a pebbly-surfaced white bottle with a silvered foil and label. The first year after the introduction of the new bottle, sales of the carbonated water jumped 400 per cent.

habitual modes of action, his reading, radio listening, and so on. The job of consumer research in broad outline is clearly the determination of what people want and how they usually get what they want, with regard to manufactured goods and services.

### 3. TECHNIQUES OF CONSUMER STUDIES

Only incidentally in the course of discussing the objectives of consumer studies has mention been made of the techniques employed. How does the consumer researcher go about his job? What sources are available that throw light on the whims and wishes of buyers? Here again the discussion will be arbitrarily presented under five heads solely for the purpose of convenience. To simplify the treatment even further the special techniques employed in testing advertisements as such will be postponed at this point.

#### *The Method of Genius*

Occasionally an industrial designer, research engineer, or manager is singularly successful in taking the pulse of the public. The brain children of these men sometimes meet with ready acceptance. Henry Ford's early lead over other automotive engineers has been attributed to his effort to build cars for other people to ride in. In contrast, his contemporaries were largely concerned with building cars that they themselves would enjoy driving. This ability to take the consumer's point of view is rare but spectacularly economical, when it works. One's skill in foreseeing consumer demands can never be revealed unless the skill is put to an actual test. Several attempts at designing goods or services may prove to be costly failures. A single attempt may be brilliantly successful. The method of genius is not to be ignored, but it must also be labeled undependable and hazardous. Its use today can hardly be justified in view of the more reliable techniques discussed below.

#### *The Survival-of-the-fit Method*

The survival-of-the-fit method in judging the public's likes and dislikes has a wealth of precedent. It is the method formerly employed by all enterprises in the presurvey days and by many of the less progressive manufacturers today. It is based on the implicit

assumption that "you can't tell what the public will accept." Concerns operating under this procedure merely turn out a variety of models of their commodity, then sit back and wait for the sales figures to reveal which sells best. The models with the best sales records are continued, with perhaps slight modifications in subsequent years. One silk manufacturer followed the policy of putting 30 per cent of his production in novel designs and new ideas; 40 per cent went into the previous year's best selling designs; 30 per cent was made up in the best selling designs of the previous year's cottons and other fabrics. Such a practice meant that the unsold materials were either allowed to gather dust as dead inventory or were sold at greatly reduced prices. Either procedure was costly, and the manufacturer was always a step behind, instead of a step ahead of consumer wants.

The inefficiency of the method, however, is not alone due to the loss resulting from unsold stock. Two other dangers are also present. First, a competitor may gain an advantage in sales that will be difficult to overcome by reason of a model that meets public preference more adequately. Second, in the early stages much advertising and sales effort is dissipated on what later prove to be unacceptable items. In some cases the losses suffered in these channels would easily defray the expenses of a consumer study. Moreover, even after a given model has demonstrated its superior selling qualities in actual competition with other models, the manufacturer may still be ignorant of the essential features that contributed to success in one case and failure in the other.

Consequently, the survival-of-the-fit method cannot be justified for large, mass production concerns except in terms of immediate expediency. In the long run, the procedure is uneconomical and provides the designer with no dependable indicators of the public's desires.

### *Standardized Interviews*

Standardized interviews with potential buyers by trained interviewers is the basic technique employed in the vast majority of scientific consumer studies. Usually the interview, covering special questions, is conducted at the home of the purchaser, although the General Motors customer research staff has collected

much valuable information through questionnaires filled out either in the showroom or at the prospect's leisure. Other concerns have used mail questionnaires with some success. The trend within recent years has been overwhelmingly toward the use of interviewers who personally solicit the desired information by means of a carefully prepared set of questions. The precise content of the interview or questionnaire will, of course, be dictated by the specific purpose of a given study. However, certain broad principles have evolved, which, if observed, will ensure highly accurate results.

### *Precautions in Questionnaire Studies*

Special care must be taken so that the opening statement or question may create a favorable impression on the respondent and at the same time get him in such a frame of mind that he will answer the questions. Particularly where house-to-house selling is an annoying practice, housewives must be put at ease by the first words of the interviewer. A frequently used formula is: "We are making a little study of what people like and dislike about magazine advertising. For instance . . ." (interviewer reads first question). The first one or two questions are usually of an innocuous nature merely setting the stage for the important questions that follow in the body of the questionnaire.

Questions must be clear and unambiguous, framed so that definite answers are possible. In a study of newspapers and magazines, the person interviewed was asked what paper he saw occasionally. This was followed by: "Which of these do you like—that is, what feature or items?"<sup>4</sup> The confusion created by this question was so marked that the question was frequently unanswered. This question was later revised to read: "What features do you like or dislike about (name each paper)?"

Another kind of confusion appears in questions leading to several kinds of answers. "What caused you to change from Sunoco to Esso gasoline?" may seem, at first, like a clear, direct question. Analyzing the possible answers, one finds the reasons may fall under three heads: alleged defects in Sunoco; alleged superior features of Esso; extraneous features such as service, advertising, advice of friends. Two or more of these reasons may have been



operative in a given shift from one brand to another, but the original question would very likely reveal only one. In place of the question given above, a series of more direct questions might be used, such as: "What objections do you have to using Sunoco? What do you especially like about Esso? What influenced you to try Esso?"

The novice at questionnaire construction can usually be detected by his indiscriminate use of "Why" questions. Whole consumer studies are devoted to the task of discovering why the buyer buys what he does. In the words of one investigator, "*Why* is never a *question*; it is always a program."<sup>5</sup> "Why" questions suffer from two difficulties. First, few people are sufficiently skilled in analyzing their motives, impulses, and trains of thought so that they can give the real reasons for their choices. Caught in this predicament the respondent usually searches frantically for an acceptable reason irrespective of its truth or falsity, assigning reasons for a choice that seem logical and "good". The second difficulty has already been mentioned in another connection in the previous paragraph. A "why" question suggests that a single factor is responsible for a choice, while, in fact, a number of factors may have been responsible. "Why" questions, therefore, tend to restrict the answer, thus dissipating the opportunity of getting a clear picture of all important considerations. More dependable information can usually be obtained if, again, a series of related and interlocking questions is used such as those suggested for discovering why people change from one gasoline to another.

A problem always tantalizingly present in every questionnaire is that of reducing to a minimum those factors which prejudice the answers in one direction or the other. The factors tending to distort answers are subtle and sometimes difficult to identify, but a few of the more important sources of error can be mentioned.

Emotionally toned words are the most obvious. "Do you approve of the wanton killing of wild life?" is sufficiently charged with prejudicial feeling that probably 99 per cent would answer in the negative. Another example is found in the study made by the Psychological Corporation in which two groups of two thousand each were asked one or the other of the following questions:

- a. Do you like the idea of having Thanksgiving a week earlier this year?

*b* Do you like President Roosevelt's idea of having Thanksgiving a week earlier this year?

Question *a* received affirmative replies in 16.7 per cent of the cases while the percentage for *b* was 21.4.<sup>6</sup> Obviously the difference in the percentages is largely due to the prestige of the President. In market research as well as in the opinion polls from which we have drawn our example, the questionnaire compiler must guard against words or phrases with emotional coloring.

Other questions to be avoided are those that obviously reflect unfavorably the respondent's pride, economic status, intellectual or social standing. A representative group of New Yorkers were asked: "What newspapers do you read most regularly?" No one admitted reading the *Daily News* or *Mirror* and only a very few confessed to reading the *Journal* or *American*.<sup>7</sup> Anyone who admitted reading these sensational sheets would immediately place himself in an unfavorable light. The extent to which pride of social standing can distort questionnaire results is further revealed in a survey designed to discover what people would buy in January sales.<sup>8</sup>

Would you be interested in a sale of: Oriental rugs \_\_\_\_ American orientals \_\_\_\_ Wilton rugs \_\_\_\_?

If you are planning to buy a new set of furniture, which are you most likely to buy? Living room \_\_\_\_ Dining room \_\_\_\_ Bedroom \_\_\_\_?

What do you consider a reasonable price for your husband's shirts? \$1 00 \_\_\_\_ \$1 50 \_\_\_\_ \$2.00 \_\_\_\_ \$2.50 or more \_\_\_\_?

These questions proved of little value since twenty questionnaires from a locality where purchasing power was known to be very low gave the following results:

18 indicated an interest in oriental rugs.

19 indicated the intention to buy a set of furniture

14 mentioned \$2.00 as a fair price for their husbands' shirts.

The majority of the answers were apparently dictated by the desire to maintain a "front" in the eyes of the interviewer. Among a higher economic group this distorting influence might not be so potent a factor. However, questions directed at needs would probably have been superior to those actually used

Related to the problem of avoiding situations that place the respondent in an unfavorable position is the necessity for guarding

against the possibility of a succession of "don't know" responses. An unbroken series of "don't know" answers suggests that the respondent is ignorant. If the respondent cannot give definite answers, he is apt either to end the interview or guess in an effort to conceal his apparent ignorance. The results in either case are unfortunate.

The context of questions must also be considered. Questions calling for a specific answer preceding questions of more general nature give distorted results. For example: "Are you annoyed by the vertical strip in the center of the modern windshield?" should follow rather than precede the question, "What improvements would you suggest concerning the windshield?" The specific question suggests the answer to the more general question.

Questions requiring the subject to check several possible answers are used sparingly and cautiously. Where information concerning the readership of a long list of magazines was desired, the interviewer inquired about magazines bought or subscribed to for home use and the list of magazines was provided for the interviewer to read and check as the respondent gave his answers. In a second questionnaire given two weeks later to the same people a simple free response was secured. (For example: What magazines do you buy or subscribe to?) Comparison of the two sets of answers indicated that the check list encouraged the respondents to report more magazines than they really owned.<sup>9</sup> One way of avoiding this tendency to overstate is to reduce the number of possible responses. Occasionally this can be done, but on the other hand distortion may also be produced if the list is not exhaustive. The careful question builder either avoids the use of long check lists or provides ways of independently verifying the answers.

This brief description of some of the most important sources of difficulty in standardized interviews leads one to wonder whether any survey of consumers can ever hope to attain a modicum of accuracy. The very fact that questionnaires are susceptible to many ills has led to the practice of pretesting the interview schedule before it is extensively used. This practice usually calls for a number of specially trained interviewers going out with the tentative form and conducting interviews, directing their attention at sources of confusion in meaning, difficulties in recording

answers, and any obstacles imposed either on the respondent or interviewer that prevent a truthful recital of the answers. In practice it has also been found advisable to carry through all operations of tabulating and analyzing the returns just as if it were a bona fide survey. These tabulations frequently reveal, among other things, questions that give a high proportion of rationalized answers as illustrated in the case of the department-store survey on rugs, furniture, and shirts. Moreover, some of the minor clerical details can be smoothed out so that the mass of data from the extended survey can be handled more expeditiously. A test survey is one of the surest ways of discovering the hidden defects in questions and procedure, frequently saving much time and energy that would otherwise be wasted on insignificant or confusing questions.

### *Field Tests and "Home Inventories"*

In a number of instances the determination of consumer preferences can be readily discovered by means of field tests alone or in connection with an interview schedule. An example of the use of field tests to check preferences earlier discovered through other means is found in the story of Teel related on page 327. Here the manufacturer asked potential customers to compare his new product against their preferred brand. A somewhat different type of field test is illustrated in an investigation of the effect of slight odors on judgments of the quality of silk hose.<sup>10</sup> Four pairs of hose were employed, all of the same style, color, and texture, but were packed in separate boxes each perfumed very slightly with a different odor. The odors were almost nonexistent as shown by the fact that only 6 of the 250 housewives interviewed noticed any scent. The interviewers merely asked the respondents to examine each pair of hose and "find the best quality." Proper precautions were taken so that odors would not conflict. According to the laws of chance one would expect that if odor had no effect upon the judgments of quality, each of the four pairs would be selected approximately 25 per cent of the time. Actually, one pair with a slight narcissus aroma was selected 50 per cent of the time while the pair with the natural, slightly rancid odor of silk was chosen as the best quality only 8 per cent of the time. Here a field study

revealed preferences that could never have been discovered through questionnaires alone.

Occasionally it is possible to check the accuracy of questionnaire responses concerning the use of a particular commodity by an actual count of homes using the commodity. In an attempt to determine the effectiveness of a given series of radio programs the sponsor sent out interviewers who were frequently able to get into the house and determine whether the advertised brand and competing brands were actually in the pantry, boudoir, or medicine cabinet. On another survey the interviewers asked first what brand of cells was in the owner's flashlight. Later, the interviewer offered to exchange the old cells in the light for a new set. The accuracy of the earlier answers was thereby determined. Another investigator got a rather direct indication of magazine readership by having his interviewers solicit old magazines for use by a charitable organization. The collection of magazines from homes revealed a number that the respondents had not admitted buying in a previous questionnaire.

### *Paired Comparison Judgments*

It is not always necessary to resort to indirect or disguised methods in using field tests. It is sometimes possible to obtain the cooperation of a representative group of customers for rather extensive measurements of their preferences. One distillery has conducted numerous tests of taste preferences by simply calling up a near-by tobacco concern and inviting a designated number of men to taste various samples and indicate their preference. In tests of this sort, especially where three or more samples are to be compared by a single person, a simple judgment is not always easy. If the taster is asked to judge which is best, poorest, and medium in quality, distortion of data may result from memory and other factors. Often the first sample tastes best just because it was first and uncomplicated by other tastes. On the other hand, the first taste may be remembered less clearly than the last. A more accurate but time-consuming procedure that circumvents these objections is the paired comparison method. Thus, if three items A, B, C are to be compared, A and B are compared in that order, followed in turn by B and C, C and A, C and B, B and A, A and C.

This system makes it possible to compare each item with every other item twice. Moreover, each item has also appeared both first and last in the comparisons, thereby neutralizing any effect produced by the "position" in the comparison sequence. Once preferences are obtained in this manner from a representative group of customers it is necessary to calculate the frequency with which items A, B, and C were preferred. Using this method the distillery mentioned above found to their consternation that when the tasters had no knowledge of the brands tested, their less expensive brand was preferred over a more costly one.

### *How Many Interviews Are Necessary?*

The problem of how many interviews or test returns are necessary to picture accurately the consensus of the buying public is present in every consumer study. Ideally a consumer study should include enough people (cases) so that an accurate indication of the buyers' preference is obtained, but not so many that the project is unnecessarily expensive.

The gross number of cases necessary to ensure a high degree of accuracy can be reduced materially by a careful determination of the salient characteristics of the group that buy the product in question. The vast majority of sport clothes for young men and women are probably sold to college students. In any survey dealing with these articles it would obviously be unwise to include a large percentage of respondents from industrial areas. Likewise, there is little point in General Motors attempting to discover auto features that will meet with acceptance by interviewing a large proportion of secondhand auto owners. They are not the people who are going to buy the new models. In surveys of this sort it is wise to take a "selected" sample of the potential buyers. The sample is chosen according to age, sex, buying power, geographical location, and other pertinent features so that the proportions in these characteristics are the same in the sample as in the total purchasing group.

The precise number of interviews required will, of course, vary with the special nature of each study. The method of serial groups has proved of value in indicating when sufficient data have been collected. The method consists essentially in tabulating the returns of, say, the first two hundred interviews and then tabu-

lating the second two hundred interviews separately. If no significant difference appears in the proportion of specific responses to key questions in the two groups of interviews, there is little reason for collecting additional data. One department store was interested in discovering what newspapers their charge customers usually read. The method of serial groups was applied to the returns with the following results:

Table 13. Percentage of Charge Customers in Each Group of the Series Who Checked the Papers Listed<sup>11</sup>

<i>Newspaper</i>	<i>First 350 Replies</i>	<i>Second 350 Replies</i>	<i>First 700 Replies</i>	<i>Second 700 Replies</i>
<i>Times</i>	30.9	29.9	30.4	30.1
<i>Herald-Tribune</i>	24.7	25.3	25	24.8
<i>Sun</i>	26.1	25.5	25.8	25.7
<i>Post</i>	8.9	9.7	9.3	9.1
<i>World (A.M. and P.M.)</i>	6.5	7.7	7.1	7.4
<i>Journal</i>	.9	1.3	1.1	1.5
<i>Telegram</i>	3.1	4.3	3.7	4.3

(These percentages do not add up to exactly 100 because some checked more than one paper and others failed to check any.)

These results show that in this case there is no reason for continuing beyond 1400 returns. The degree of accuracy as revealed by a comparison of the first two columns is indeed high enough for many purposes. For instance, one could conclude from the first 350 returns that approximately 80 per cent of the charge customers would be "covered" by advertisements in the first three papers listed. The 1050 returns that came in later did not materially change the basis for this conclusion. The degree of accuracy to be attained by any given study may be determined in advance by the purpose of the study or by a consideration of the lines of action that are to be taken in the light of the findings. When the serial groups show differences that are less than the degree of error required, then the collection and tabulation of data may safely cease.

The results of the newspaper reading survey given above are not to be taken as typical of all such studies. In that instance the total number of customers was comparatively small at the outset and formed a rather homogeneous socioeconomic group within a restricted geographical area.

Public opinion polls, which depend for their accuracy upon the same principles as consumer surveys, have predicted the presidential vote with an accuracy of approximately 1 per cent error after interviewing approximately 5000 selected persons or about 11 out of every 100,000 voters.<sup>12</sup> The experience of some of the polls of public opinion shows that accuracy of results is not primarily determined by quantity of data alone. A sample that is "overloaded" with persons of given characteristics so that it is not truly representative of the total group cannot be corrected by accumulating more and more data. The essential conditions ensuring accuracy of results are, first, that the sample be selected according to the known characteristics of the total purchasing group and, second, that sufficient returns be obtained so that the results remain within the desired limits of error as tested by the method of serial groups.

#### 4. TECHNIQUES IN TESTING ADVERTISEMENTS

Since one of the functions of consumer research is to discover the effectiveness of the so-called extraneous determiners of buying behavior, it is important to consider the principal methods employed in discovering the effectiveness of advertising.

##### *Consumer-jury Opinion Tests*

Some agencies make a regular practice of submitting in rough form several possible advertisements of a given product to a group of people representative of the consumers to be reached. The consumer jury may be asked to rate the advertisements either as to their over-all effectiveness or with respect to specific features such as their sincerity, attention-getting qualities, forcefulness, or persuasiveness. Such tests derive their chief advantage from their low cost and the quickness with which they can be run before publication. Their validity, however, is open to question. Some investigations have shown that consumer juries are able to arrange advertisements in an order that correlates well with the number of coupon returns per advertisement.<sup>13</sup> Other studies have shown virtually no correspondence between consumer ratings and the later "pulling power" of the copy as measured by sales, readership, or coupon returns.<sup>14</sup> Such opinion studies are probably better



than the uncontrolled judgments of one or two persons around an agency, but until the procedure has clearly demonstrated its degree of dependability, it is probably wise to consider it only as a rough method for indicating advertising effectiveness.

### *Reader Recognition Tests*

Among the most popular of all devices to determine the readership of advertisements are the house-to-house surveys of magazine and newspaper reading. Usually the interviewer carries a collection of current magazines and asks the housewife which she has read. One or more of the magazines is then examined page by page and a record is kept of all the material recognized as previously read. Numerous variations on this basic procedure have been worked out. In some cases, the trade name and other identification marks are obscured and the respondent is asked to name the advertiser. This latter procedure gives some indication not only of attention-getting qualities, but also gives a measure of the memory value or impressiveness of particular advertisements.

It has long been known that such surveys of readership are open to errors both on the part of the respondent and the interviewer. On his part, the interviewer's manner may either encourage the respondent to "recognize" advertisements that he has never seen before or conversely, may discourage the identification of all except those about which the respondent is absolutely positive. On the other hand, respondents differ in their veracity. In addition, a degree of honest confusion may result when a given concern runs a long series of very similar advertisements. The amount of false identification cannot be predicted prior to publication. However, a system has been worked out whereby corrections in the reported recognition scores can be made by running a survey of the "recognition" of certain advertisements before their release in magazines. Later the same interviewers covering a comparable neighborhood obtain the postpublication recognition scores for the same advertisements. A suitable correction formula has been devised giving the net recognition score.<sup>15</sup>

When properly controlled by prepublication surveys or through extensive training of interviewers the recognition tests give reliable information on the attention value and readership of adver-

tising copy. Several commercial concerns have been established for the purpose of conducting such surveys so that a given advertiser need not train a special staff of interviewers for his particular study. Moreover, the fact that the interviews are conducted by a relatively disinterested organization probably contributes to the objectivity of the findings. The chief disadvantage of the technique lies in the fact that a given appeal, advertising device, or type of copy must be published and considerable money spent upon it, before it can be tested.

### *Radio Listener Surveys*

Allied to the recognition tests for written advertising are the listener surveys made for sponsored radio programs. These are of two principal kinds, the coincidental survey and the recall type, both made by telephone. In the first (used by C. E. Hooper, Inc.), calls are made from some central office to a selected group of telephone homes. The respondent is asked to what program or station his radio is tuned. Generally he is also asked to identify the sponsor. In the recall survey (used by Cooperative Analysis of Broadcasting) the informant reports the programs he has heard in the previous two hours (sometimes more). These two methods can be combined to give a picture of the extent and composition of a radio audience during any selected period as well as some indication of previous program audiences. Of course, it is possible at a much greater cost to conduct more extensive surveys of listening habits by door-to-door interviews.

The telephone survey has a number of advantages, the most outstanding being: (*a*) the possibility of very rigid control of the questioning through central supervision; (*b*) the collection of results in a comparatively short time; (*c*) the low cost per interview. On the other hand, it is difficult in the short interval to get respondents oriented to the subject, some being perplexed by the call to such an extent that they report incorrectly. Other listeners may resent the intrusion of such a call, especially if they are over-interviewed. There is a danger that such ill-will may reflect on the sponsor. The surveys are ordinarily limited to urban areas and obviously to telephone homes, thus eliminating the lower socioeconomic radio homes without phones and those in rural and small-

town areas. The interviewed group is therefore not truly representative of the whole radio audience.

Several less popular methods for measuring radio audiences are available. One is an automatic recording device installed in the respondent's radio set that makes a record of the precise time when the set is tuned to particular stations. These recorders can be placed in the set on the excuse that the utility company wants to measure the consumption of current, thus tending to keep the listeners from modifying their habits during the test period. After eight days or a month, the service man returns to collect the recorder and may question the housewife or other members of the family to get a measure of their memory for particular programs. By itself, the recorder shows without distortion what programs came into the house. Combined with the interview it gives an indication of the effectiveness of the programs heard. Probably the most important reason for the limited use of this procedure is the cost of the recorders (about \$30 each).

The panel is another less popular device for measuring not so much the coverage of a program but rather its quality. It is somewhat analogous to the consumer-jury tests of written advertisements in that a selected group of people volunteer to give their opinions from time to time on the quality of a program series, the station's reception, signal quality, or the program balance. One of the chief advantages of such a panel is the possibility of gaining more elaborate detailed responses than in a regular survey.

### *Sales Tests of Advertising*

Tests based on increased sales are perhaps to the outsider the simplest, most direct way of measuring advertising effectiveness. The researcher looks upon them as one of the most deceptive and trickiest of all methods, largely because sales may be influenced by a great many factors other than advertising.

The sales test necessitates a survey either of consumers or of retail outlets before and after the run of test advertisements. Consumers are surveyed to discover whether they have on hand, habitually buy, only occasionally or never purchase the article in question. Sometimes questions bearing on the consumer's opinion of the product are included. A suitable time after the test adver-

tisements have appeared a comparable survey is conducted over the same area to discover the increase in usage or good will. Using retail outlets to obtain sales figures before, during and after the test campaign saves some time and cost but eliminates the possibility of getting the consumer's evaluation of, and attitude toward the product, features that are of great significance to the producer.

It is not usually possible for a national advertiser to use a given market area for test purposes more than once in a number of months. Consequently, if a number of copy variations are to be tested, it becomes necessary to find several areas of comparable economic status, with approximately the same number of retail outlets, the same amount of advertising coverage (newspaper space and circulation, billboard space) and the same degree of isolation of nontest markets. By using several test areas at the same time the advertiser can compare a number of test elements in his copy within a short time, thus eliminating variations in sales due to seasonal variations.

A sales test runs the risk of being upset by a number of factors, only some of which are within the possibility of control. First, a competitor may feel that the test campaign is especially successful and launch a special selling drive of his own. Second, the retailers or salesmen may put forth additional efforts to take advantage of the current campaign. Certain advertisements in the series may strike their fancy and induce them either to accelerate or slacken their selling efforts accordingly. Third, some newspapers make a practice of supporting advertisers in their columns by running feature stories that constitute "free advertising." When such features are likely to disturb the influence of the regular copy, editors may be asked to cooperate by postponing their stories. In addition the sales test is limited in application to only those products that have a fairly quick resale cycle, and to those whose style or quality changes are relatively infrequent.

Of course the sales test has the advantage of giving an indication of the degree to which advertising is doing precisely what the advertiser wants it to do: sell goods. Any other type of copy testing is only a means to this end. In cases where goods are sold direct to consumers as in mail-order houses, many of the above

objections disappear. Here the gross sales figures are in effect measures of the advertising.

### *Coupon Returns and Inquiries*

A frequently used measure of advertising effectiveness is the number of coupons returned or inquiries about some premium, booklet, or free sample. The coupons can be coded to show from what magazine or newspaper they were clipped and can be traced to the particular advertisement which attracted the respondent's attention.

Ordinarily a count of inquiries provides a fair index of the advertisement's "pulling power." However, a number of factors may complicate interpretations of the results. An undetermined percentage of the returns come from curiosity seekers and children who are not real prospects. Some people like to vary the dull tenor of their lives by receiving mail, and clip coupons regardless of their interest in the product or the advertisement's effectiveness. Furthermore, copy which brings a large number of inquiries may not necessarily be good selling copy. In one instance an insurance advertisement devoted 80 per cent of the space to urging the prospect to send for a free booklet. A large number of booklets were distributed but the sales to these coupon prospects were below average. In contrast, another insurance advertisement used only 10 per cent of the copy in mentioning the free booklet. The number of requests was reduced but the volume of sales was greater than in the first case.<sup>16</sup>

Another complicating feature is the value of the premium offered. It must be important enough to stimulate inquiries but not so valuable that people will search for advertisements making the offer. The sad consequences of ignoring this feature were revealed in the case of the soap manufacturer who ran a series of test advertisements differing in copy but all containing an offer of a free carton of five cakes of soap. The number of requests per newspaper advertisement during a three-week period are shown in the following list. The build-up in volume of requests was undoubtedly due to word-of-mouth advertising about the "wonderful free offer of soap" rather than the copy's effectiveness.<sup>17</sup>

<i>Advertisement</i>	<i>Requests</i>
First	175
Second	188
Thrd	226
Fourth	173
Fifth	543
Sixth	514
First repeated	437

In spite of these difficulties coupon returns have a number of advantages. First, they give a fair indication of the extent to which the copy leads to action after it has attracted and held attention. Second, the advertiser can test a number of different magazines or newspapers simultaneously with the same copy to find the best media. Third, if proper care is taken in preparing the copy, the names and addresses of respondents make possible a list of better than average prospects, thereby defraying at least part of the test costs.

### *Laboratory Methods*

In addition to the methods just outlined, most of which demand that the advertisement be released and then tested in the field, a number of procedures are available for testing advertisements in the laboratory. One of the oldest and most widely used techniques is the "dummy magazine." Test advertisements are pasted in the magazine and subjects are asked to leaf through the issue as they would under normal circumstances. After a stated period of time the subjects are tested for their memory of particular layouts. In this way it is possible to vary systematically any single factor such as position, size, isolation, kind of illustration, and copy. It provides a highly controlled situation in which factors extraneous to the one under consideration are reduced to a minimum. The chief disadvantage lies in the charge that the attitude of the subjects is not comparable to the attitude of the ordinary readers. The results therefore may not be typical of the regular readers.

Another very promising laboratory approach is through the studies of eye movements during an inspection of printed media. A number of eye-movement cameras have been developed for this purpose, best of which is probably the Purdue camera, so designed

as to give the subject almost complete freedom to examine the magazine or newspaper as he pleases without knowledge of precisely when his eye movements are being recorded. Records of this sort show exactly what attracts attention first, how long given items on a page are fixated, and how much is read. Eye-movement records can be used to supplement tests of memory in connection with dummy magazines or with regular issues. The kind of information supplied by eye-movement records is exemplified in the study which showed that cartoons appearing on the same spread with advertising matter detracted from the time spent in looking at the advertising.<sup>18</sup> Probably no other procedure could have demonstrated this fact so well as the eye-movement camera. The chief advantage of these devices lies in the possibilities of testing rough but nearly complete layouts prior to publication. Such a procedure eliminates the publication costs and possible wasted expenditure on ineffective copy. On the negative side is the tedious care with which the films must be examined, although this is perhaps less serious than the fact that the method is limited to problems of attention and gives no indication of the convincing, or selling, features of the advertising.

Throughout this discussion of techniques in measuring advertising effectiveness the advantages and disadvantages of each method have been pointed out. If a thorough job of testing is to be done, probably two or more methods ought to be employed simultaneously.

## 5. SUMMARY

This chapter has discussed the consequences of consumer research as they affect the designing, engineering, advertising, and sales departments in large-scale manufacturing enterprises. The objectives of consumer studies have been outlined under three heads: first, the discovery of those attributes of an article that are liked or used, and those that are disliked or not used; second, the discovery of pertinent characteristics of the buyer and his behavior that determine purchases; and third, the discovery of all other factors that influence the choice of a particular brand or commodity. The techniques of consumer studies have been outlined with particular emphasis upon standardized interviews and field

tests. Some of the important precautions necessary for accurate results have been outlined. Finally the most important methods currently used to evaluate both radio and published advertising were reviewed.



# Chapter 13

## ADVERTISING

Probably no other single topic within the scope of business psychology holds as much interest for the average student as advertising. To many it is a big, mysterious business, subtly pushing buyers toward this or that special brand by invisible forces beyond the ken of normal men. Vast sums are spent (about \$2,000,000,000 per year) for direct mail, billboard, newspaper, magazine, radio, point of sale, and novelty advertising, all of which is assumed to boost the advertiser's sales far beyond what they would have been without these devices. There is a general belief that advertising pays. Just how and through what channels is the big mystery.

The blunt fact is that some advertising does not pay, and the benefit to the advertiser from other copy is of doubtful value. Until the development (largely in the past fifteen years) of scientifically controlled testing devices such as were discussed in the previous chapter, the value of particular campaigns was as much a mystery to the producer as it was to the public. The producer knew that his sales record was favorable, but no one knew whether that was a reflection of the advertising, the selling efforts, a fortunate fashion trend, or a superior product. With the refinement of copy-testing procedures to which the psychologist has contributed, some of the guesswork in advertising has been removed.

The interest of the psychologist in advertising stems from the fact that advertising is basically a problem in controlling human behavior and human attitudes. Stated in that fashion, the problem falls well within the area of psychology. The broad problem can be readily reduced to a number of specific questions, such as: What are the special ways in which behavior or attitudes are to be changed? What are the psychological objectives of advertising?

By what particular devices can these objectives be attained? Of the various devices available for changing behavior or attitudes in given directions, which are most effective?

The discussion in the present chapter will be limited largely to newspaper, magazine, and radio advertising, for two reasons. First, the psychological principles that apply in these areas are to a very large extent applicable to other media as well. Second, these channels are probably most important because they absorb the major portion of the total advertising bill of the country.\*

## 1. BUSINESS OBJECTIVES IN ADVERTISING

The objectives of advertising as defined by business are not always identical with the objectives as defined by the psychologist. The business objectives will be considered first.

### *Immediate Sales*

The ultimate aim of all commercial advertising is to garner more sales, but not all advertising is directed to this immediate end. Only a comparatively few advertisements are designed with the expectation that they will carry the prospect through the entire selling process from the stimulation of a want to buying action. Copy designed for this purpose is used principally by mail-order houses and by retail stores. Even the latter may not always be aimed at immediate sales but may be designed merely to attract prospects to the store where the real selling efforts are made. The best examples of selling advertisements are those which attract attention, describe the product, and provide a coupon order blank with instructions to the effect that "if you are not completely satisfied, you may return the unused portion and your money will be refunded in full." A number of concerns have successfully used such advertising exclusively. In point of number of sales (more than one hundred million), probably the campaign of Haldeman-Julius' Little Blue Books ranks first among the straight selling advertisements.

### *Building Internal Morale*

One of the important purposes of advertising, especially during

\*Excluded also is all government advertising, used especially in England to maintain civilian morale and to give special instructions to the public for handling emergencies during the war.

the war, is the promotion of employee morale. The Studebaker Corporation has been an outstanding user of copy that emphasized the skill, the ruggedness, and the contentment of their employees. In telling the public of the virtues of the working force a manufacturer indirectly affects the working force itself, for compliments are accepted more readily when made indirectly. If Mr. Brown tells Mr. White that Mr. Green is a fine businessman, Mr. Green is more likely to believe the statement is an honest opinion than if Brown made the statement directly to Green. There is the additional factor that once an oil company, for example, claims in nationally distributed copy that its courteous service is always given with a smile, the filling-station employees feel called upon to live up to the claim.

### *Securing Prospects*

Some advertising, especially that which is concerned with high-priced goods or is directed to commercial buyers, is designed merely to obtain a list of interested prospects. The copy often ends with a coupon requesting additional information or inviting a salesman to call and explain the service or product in greater detail than the advertisement permits. Manufacturers of office appliances, reference-book publishers, and insurance companies, who must use intensive sales efforts, frequently employ this approach.

### *Reducing Sales Resistance*

"Sales resistance" is a hackneyed term covering a vast number of factors, all of which tend to inhibit buying. Advertising can be used to reduce the potency of some of these factors. Since specific goods and services each have their own sources of sales resistance, copy designed to this end may take numerous different forms. In the case of products sold only through house-to-house salesmen, the advertising serves to introduce the salesman and build the prestige of the company. Sales resistance is reduced by paving the way for the salesman. Other advertising may reduce resistance indirectly. Producers of parts, or of materials used in the manufacture of consumer articles, advertise to the general public expecting to enhance not only their own reputations but the reputations of their clients, thereby increasing sales. If the consumers of frying

pans have been convinced that "Duro-metal" is a high-quality material suitable for a great many purposes including frying pans, they are likely to ask for Duro-metal pans. The sales resistance both of the ultimate consumer and of the fabricators of frying pans is therefore lowered. Measures to intensify the demand for a product that is already well distributed also operate to reduce resistance. Flour and shortening producers supply free recipe booklets suggesting new ways of using their products. The telephone company may suggest the savings in time and tires by telephone shopping, or the safety feature in having a bedside phone in the case of burglary or sudden illness. All of these are ways of reducing sales resistance through advertising.

### *Building Good Will*

Producers and distributors are exceedingly sensitive about the attitude of the public toward themselves. Every small-town merchant knows that people tend to buy from their friends, from the people they know best, and from those who supply free service. A number of large producers have used this principle in their own advertising by calling attention to the virtues of their retailers. A drug manufacturer may run a campaign in the media reaching consumers, pointing to the homely qualities of the corner druggist or to the inconveniences of a physician's life in combatting disease and easing Aunt Ella's midnight pains. This type of copy creates good will among the druggists and physicians and tends to enlarge the producer's market. With the curtailment of auto production in 1942 the automobile manufacturers ran extensive campaigns emphasizing the repair services of their dealers, hoping thereby to keep the dealers in business and ready to sell cars once more when auto production restarts. These are examples of free advertising for the retailers. They build the good will of the producer among his immediate buyers.

### *Keeping the Brand Before the Public*

Some copy merely serves to remind the public that Whitman's candy or Coca Cola is still for sale. Much outdoor advertising falls under this head, since the reading time as one passes a billboard is necessarily short. "Reminder" copy merely mentions the trade-

name and product with hardly a suggestion of its special qualities or values. Such copy operates on the principle that frequency of presentation tends to make the trade-name a household word so that it will be readily recalled when the need for the product arises. There is a legitimate use of reminder copy, but all too frequently the poor work of some agencies is justified on this basis alone. Even incredulous claims and uninteresting layouts may not be completely wasted if the trade-name, at least, makes an impression.

The chief business objectives of advertising are, then, to gain immediate sales, to build employee morale, to secure prospective customers, to reduce sales resistance, to build good will, and to remind the public.

## 2. PSYCHOLOGICAL OBJECTIVES OF ADVERTISING

The last of the above objectives is one that might be considered psychological. At least it represents a transition from an emphasis that is primarily economic to an emphasis on the memory factor.

### *Impressing the Prospect's Memory*

Certainly a large amount of advertising is presented at a time when people are not in a position to buy. When the radio announcer urges a trial of this cigarette or that gelatine dessert, consumers do not immediately run to the store and buy the advertised brands. The announcer must impress them sufficiently so that when the time and opportunity are ripe they will at least vaguely recall what was said and ask for the advertised brand. Stated in a different way, advertising, to be effective, must have some memory value. It must be sufficiently impressive at the time it is read or heard so that it will be recalled hours, days, or weeks later.

### *Gaining and Holding Attention*

It is obvious that before an advertisement can impress potential buyers it must attract attention. This is perhaps the basic psychological objective of advertising, since all other ends depend on how many readers or listeners are attracted. A superior advertisement from all other angles is a complete loss unless it is read or heard, and to be read or heard it must attract and hold attention. The

psychologist, then, is interested in discovering and evaluating devices that contribute to the advertisement's attention-getting qualities.

### *Satisfying Wants*

People do not buy just for the sake of buying. They buy ordinarily to satisfy some want, some desire, some need. The needs which a given product may satisfy are not necessarily self-evident to the public. Soaps are designed for washing purposes, to loosen dirt and grease. Every purchaser knows that. But one company made the public keenly conscious of Life Buoy's aid in gaining popularity and business success. A mild mouth antiseptic moved from an obscure place on the marketing scene to the center of the stage through advertising that appealed to the same desires.

As we have pointed out in the previous chapter, it is important to discover precisely what desires are satisfied by a given product and what features the consumers find outstanding. Not all products can be sold by associating them with the appeals that have proved successful for a toilet soap or a mouth wash. But the advertisement must be built around a statement that touches a desire held by a large number of prospective purchasers. Contrary to some popular opinion, the advertiser is much less concerned with creating new wants than in finding better ways of satisfying existing desires. Ordinarily he does not care to lead or pioneer in an educational way other than to display his goods or services as a way of satisfying either a previously unsatisfied desire or one that has been inadequately satisfied by competitors.

### *Producing Conviction*

Psychologically, effective advertising must not only relate the product to basic satisfactions but must be convincing as well. This does not necessarily imply that the advertisement must be limited to logical or "reason why" copy. Purchasers are often convinced through emotional appeals, indirect suggestions, or dogmatic assertions. Advertisements that tax the public's credulity, that present improbable claims, however truthful, are likely to create, not a desire to buy, but rather suspicion and distrust of the advertiser. A manufacturer discovered that one of his regular card tables would

support the weight of a half-grown elephant, but the copy making this claim was less convincing than the claim that his tables would each support four men. The first assertion was beyond the credulity of the public. One of the psychological objectives in advertising, then, is to convince the prospective buyers that the satisfactions claimed for the product will actually be obtained.

### *Producing Action*

It was pointed out in the preceding section that not all advertising is designed to induce prospects to buy immediately. However, it is desirable for a number of psychological reasons to entice the prospect to clip a coupon, write the trade-name, ask his dealer or "the man who owns one," try a sample, enter a contest, or request the booklet. None of these examples of action involves buying behavior, although they may be the initial steps in a series of actions that culminate in buying. Such action, moreover, contributes to the memory value of the advertisement, since the names dealt with or actively manipulated are remembered with relative ease (see Chap. I). In addition, action probably reenforces whatever convictions the prospect may have with respect to the advertisement. Finally, the action ordinarily leaves the door open for subsequent selling efforts.

Summarizing, effective advertising from a psychological standpoint ought to attract and hold attention, show how some important want can be satisfied, be convincingly impressed in memory and suggest some action relevant to the product or producer. These psychological objectives are not incompatible with the business objectives previously outlined. Instead, the business objectives can be attained only if due consideration is given to the psychological aims. Indeed, the psychological aims may be thought of as the means whereby the business objectives are attained.

In the remaining portions of this chapter will be discussed the devices that in a large measure influence advertising effectiveness, viewed from the psychological standpoint.

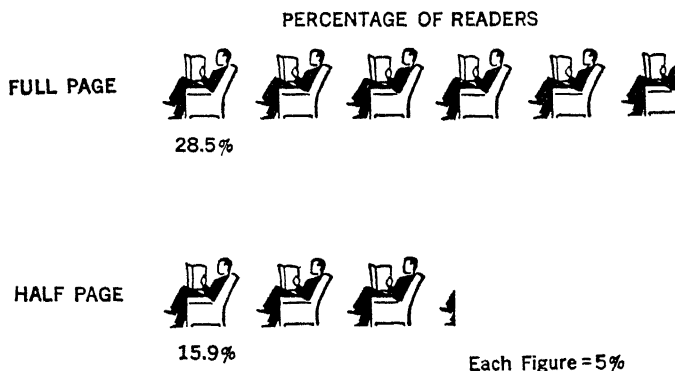
## 3. ATTENTION-GETTING DEVICES

### *Size*

The size of an advertisement is an important factor in determining its attention-getting qualities. Typical of the findings from

commercial agencies is the following figure showing the percentage of readers who "saw" advertisements of different size.<sup>1</sup>

Although, as this figure indicates, full-page spreads ordinarily attract more attention than smaller layouts, the precise evaluation



*Figure 33 Showing Median Percentage of Readers Who "Saw" Black and White Advertisements in Four Popular Weekly Magazines. From Daniel Starch & Staff, Consumer Magazine Report, May 1942.*

of size, uncomplicated by other factors, is rather difficult. In the first place, a large magazine or newspaper advertisement is more costly and may be prepared with greater care than smaller insertions. Second, a large space provides the copywriter and layout designer with greater opportunity to use other attention-getting devices that will be discussed later. Any study of attention qualities using regular advertising may be upset by either of these uncontrolled factors. In an effort to reduce these complicating influences to a minimum, one investigator used cards the size of a standard magazine page. On these were mounted five designs, four of them of the same size and one being four times the area of any one of the smaller ones. These were exposed to subjects for ten seconds, during which time their eye movements were photographically recorded. Taking as the measure of attention the length of time spent in looking at the design, the results show that the larger design had about twice (actually 1.99) the attention value of any one of the smaller figures. Using pictures of the Dionne quintuplets and, like the designs, making one of them four times the size of the others, a similar procedure was followed. With this



material the fixation time ratio of the larger to the smaller areas was 1.87.<sup>2</sup> The position of the larger design or picture was systematically varied so the findings could not be attributed to this factor. A subsequent study by the same author, using much the same procedure, demonstrated that memory for designs is roughly proportional to the fixation time, at least when the total time limit for viewing the card is only ten seconds.<sup>3</sup> This in part justifies the previous assumption that fixation time is a satisfactory indicator of attention.

These two reports generally confirm previous studies of the same problem using different methods. In one of the most elaborate of these earlier studies, cards were prepared, on each of which were mounted four colored squares differing in size. Four colors were used, and precautions were taken to have every color appear equally often in every size and in every position on the cards. The materials were placed in a tachistoscope—a short exposure apparatus—and the subjects were asked to indicate which colored square they saw first. Obviously the colored squares themselves had no significance but were used merely to facilitate identification. The areas of the squares were computed and reduced to the ratios given in the following table. The attention-value index was the average number of times each of the squares was seen first. These gross figures were also reduced to ratios of the reports for the smallest square. These attention-value ratios appear in the second column of the table following. Comparing areas with attention value shows a close approximation to a square-root relationship. That is to say, this study, like the one previously mentioned, suggests that attention value appears to double when size is quadrupled.<sup>4</sup>

*Table 14. Showing Relation of Size to Attention*

<i>Areas of Squares</i>	<i>Attention Value Ratios</i>	<i>Square Root of Area</i>
1.00	1.00	1.00
2.25	1.78	1.50
4.00	2.05	2.00
9.00	2.75	3.00

Studies using regular advertisements and direct measures of readership (see page 357) do not always confirm this conclusion, which in terms of the practical situation would mean that one

could expect to get double the number of readers by merely "blowing up" a quarter-page layout to a full page. The discrepancy between the laboratory findings in which the greatest control has been exercised over all extraneous factors, and the field studies with regular advertising, can be explained by the complicating influences mentioned at the beginning of this section.

In spite of the fact that increases in attention lag behind increases in size, the larger space is often advantageous for other reasons. Most printed media provide four-color layouts only in full-page spreads, thereby limiting the small spacebuyer. Moreover, the larger units of space provide for more adequate copy and illustrations. It may be that more real selling per reader is done with the larger space units.

### *Length of Radio Programs*

Somewhat comparable to the factor of size in printed advertising is the length of a program in radio. Attempts to study the relationship of this factor to the size of the audience are even more complicated than the previous problem. Not only does the content vary from slapstick comedy to serious forums within a group of similar length programs, but marked differences characterize fifteen-minute, half-hour and hour programs. The nature of the entertainment is dictated in part by the time interval. Moreover, the time of day, the popularity of simultaneous programs, the day of the week, and season of the year exert profound influences on program popularity. It is quite impossible, therefore, to equate a fifteen-minute program to an hour show in all other respects except length. In spite of these limitations it is instructive to observe the following table in which the median ratings of evening programs are listed along with the ratios of hour and half-hour programs to the fifteen minute programs.<sup>5</sup>

It is quite evident from this table that in radio, as in printed advertising, increases in audience size lag behind increases in program length. In other words, a one-hour program does not ordinarily give a sponsor four times the audience he would have with a quarter-hour period. Programs with unusually high audience ratings, when cut in length have, however, not suffered a marked drop in popularity. Two instances of this sort are the Charlie

Table 15. Median C A B. (Crossley) Audience Ratings and Ratios  
(15-minute programs considered as 1)

	60-minute Programs		30-minute Programs		15-minute Several Times per Week
	Rating	Ratio	Rating	Ratio	Rating
Winter, 1938-39	19.5	2.8	9.3	1.3	6.9
Summer, 1939	15.1	3.4	6.1	1.4	4.4
Winter, 1939-40	20.5	3.0	11.1	1.6	6.8
Summer, 1940	15.1	3.4	7.9	1.8	4.4
Winter, 1940-41	20.9	3.4	11.2	1.8	6.2
Summer, 1941	14.7	3.6	7.5	1.8	4.1
Median		3.4		1.7	

McCarthy and Major Bowes programs, both of which were reduced from an hour to a half-hour in length without changing the essential character of the entertainment. Their ratings after the cut in length were respectively 95 and 87 per cent of their former ratings, according to the C. A. B. survey. The success of these shows in holding their listeners may be due to a large proportion of loyal listeners who established the habit of tuning in early to miss none of the program. Lopping off the last half of the show would not affect the size of this group. On the other hand, the longer programs have a greater chance of picking up those listeners who just happen to be "cruising" the dial.

### *Position*

The mere position of an advertisement within the magazine or newspaper, on the page or on the road or in the radio time schedule, has an important bearing on its attention value. Let us consider each of these aspects of position separately.

*a. Newspapers and Magazines.* It is generally known and accepted that the second, and third pages and the back cover as well as the first and last pages of the advertising sections of magazines have higher readership than the pages between these limits. Most publishers, recognizing this fact, charge somewhat higher rates for these pages. In spite of the added cost, some advertisers like Campbell's Soups consistently use one of these preferred pages or none at all.

The available evidence on readership of newspaper advertisements in general conforms with the conclusion that the preferred positions are either near the front of the paper or on the last two, or perhaps three, pages. Many advertisers ask for and receive "page 7 or forward" positions because they think these positions are more effective. In spite of this fact, a study of the 180 "best read" advertisements in a representative sample of weekday newspapers in the United States and Canada showed that 70 per cent appeared back of page 7.<sup>6</sup> The study does not indicate the proportion of the total advertising before and after page 7—a fact that would be necessary to evaluate more precisely the factor of position. It is entirely likely that a higher proportion of advertising space appears on page 8 and backward, thus increasing the possibility of such spaces being among the "best read."

The reason for the greater readership of the back cover of a magazine is quite obvious. There is about a 50-50 chance that the magazine will be placed on the subscriber's table upside down, thereby exposing the advertisement to view. The inside covers derive their advantage at least partly from their primacy (for the first inside cover) and recency (for the third or rear inside cover), both of these being factors of advantage in learning. That is to say, in opening a magazine going from front to back, the first advertisement we are most likely to see is the first inside cover, while nearly the last or most recent impression will be made by the rear cover, inside and outside.

Studies of the readership of advertisements placed on the right versus the left page are somewhat complicated by the fact that some magazines place a little more of their advertising on the right hand pages. One study of one thousand pages of the *American Magazine* revealed 56 per cent of the advertisements were on the right; in the *Saturday Evening Post* the corresponding figure was 52 per cent.<sup>7</sup>

Evaluations of the superiority of one page over the other, based on coupon returns or readership surveys, tend to give a slight advantage to the righthand page. Of the "best read" advertisements in the newspaper survey previously referred to, 53 per cent were on the righthand page. Laboratory studies with dummy magazines are in general agreement, indicating a 5 to 10 per cent advantage for the right over the left page.

It is somewhat surprising that the advantage of the righthand page is not greater than the studies indicate, first because of the tendency previously mentioned to publish a few more advertisements on the right, and second, because of the habits involved in manipulating magazines. Ordinarily, in leafing through a publication, it is held in such a way that the righthand page is seen first and perhaps longer than the left. One observer noted which page each of more than seven hundred people were looking at while reading magazines in barber shops, physicians' offices, lounging rooms, streetcars, homes, public libraries, and similar places. The data showed that 40 per cent were looking at the left and 60 per cent at the righthand page. The results were also analyzed in regard to the way in which the magazine was held. So far as the advertising pages were concerned, 8 per cent were holding the left page broadside with the right either perpendicular or at an angle so it could not easily be seen, while 21 per cent were holding the right page broadside with the left at a disadvantageous angle.<sup>8</sup> These habits generally account for the readership superiority of the righthand page but suggest that one should expect the reported advantage to be greater than it is.

*b Billboards.* The attention value of billboards likewise depends in part upon their position, both with regard to the volume of traffic and their position relative to that traffic. In 1934 the Traffic Audit Bureau was created and jointly supported by leading advertising agencies and outdoor advertisers for the purpose of determining the "net advertising circulation" of various billboard positions in and around most of the important cities. The "circulation" is based on the actual number of people who pass the sign per day. This number is reduced by a certain percentage to eliminate those who may not have had a chance to see the sign. This figure is further corrected to include the influence of the speed with which people pass the sign, the length and angle of the approach. From the standpoint of the psychologists this method is admirable, provided the correction coefficients for each of the above factors are based on satisfactory surveys designed to evaluate their relative importance. In an effort to gain quick results the temptation is to make a hurried estimate of the importance of the approach angle or other factors without bothering to test their importance directly.

c. *Radio*. The position of a radio program in the time schedule exerts an important influence on its audience rating. A shift of a program from one time to another is often accompanied by a significant change in the rating. "One Man's Family" was moved from 8:30 on Thursday evening to the same time on Sunday. Almost immediately it gained an additional 11 per cent of the potential audience. Several factors beyond the scope of the present discussion are important in determining the attention value of a radio program, among them being the popularity of programs preceding and following. It was felt that "One Man's Family" gained in audience size largely because (a) on Sunday evening there is a greater amount of listening, and (b) it was preceded and followed by two high-rating programs: Charlie McCarthy and the Ford Sunday Evening Hour.<sup>9</sup> The bulk of evidence suggests the best radio "positions" are in part dictated by the nature of the program. Variety shows featuring more music than talk go best after 9:00 P.M. Forums, symphony, or serious music, find favor on Sunday afternoon. Dramatic serials—the so-called soap operas—attract listeners on weekday mornings. There is considerable evidence to show that more sets are in operation between seven o'clock and ten o'clock on Sunday evening than at any other time during the week. From this standpoint Sunday evening represents the most favored radio position.

### *Isolation*

One simple, mechanical way of gaining greater attention for an advertisement is through the use of isolation. Other things being equal, people are generally more attracted by a single billboard in an otherwise open space, or a single layout on a page containing editorial material. The competition for attention under these circumstances is considerably less when the single item stands out from its background because of its uniqueness. Users of large space may sometimes defeat their own aims by filling every available corner with copy in an effort to tell the whole advertising story. Inspection of many of the early newspaper advertisements, particularly for patent medicines and soaps, shows this tendency in the extreme. Some isolation can be attained by using a large amount of blank space and "floating" the layout.

In view of the fact that the additional space necessary to isolate a layout adds to the cost, the question arises, What is the optimal amount of white space that will give the maximum attention value per dollar? In one study dummy magazines were made up so that some pages were completely occupied by a single advertisement, others carried two half-page layouts, and still others displayed a half-page advertisement set in the center of an otherwise blank page. The attention values were, respectively 1.00, 1.41, and 1.76.<sup>10</sup> The last represents an increase in white space and cost of 100 per cent. Quite evidently such advertisements are superior to the full-page spreads, but the initial question is still unanswered, namely, what proportion of white space gives the maximum attention value per dollar? The following figure based upon a more detailed study of the problem, but using essentially the same kind of

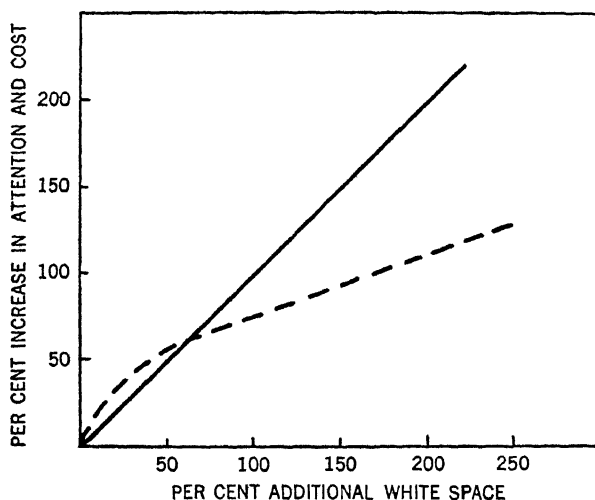


Figure 34. Showing Effect of White Space on Attention.  
From E. K. Strong, "Value of White Space in Advertising,"  
*Jr. Appl. Psychol.*, 1926, 10, 107.

dummy magazines, indicates that when the white space exceeds 60 per cent of the space occupied by the basic layout, diminishing returns per dollar set in. The straight line shows the increase in cost with additional space. The dash line represents the increase in attention value.

Expressing the relationship somewhat differently, the optimal

isolation per unit cost is obtained when the surrounding white space accounts for approximately three-eighths of the total area.

Using duration of fixation as a measure of attention, Brandt recently found that spaces in which 75 per cent was occupied by a photograph and 25 per cent by a white border, had greater attention value than those with 0 per cent, 50 per cent, or 75 per cent white space.<sup>11</sup> This study agrees reasonably well with the previous one, considering the differences in methodology.

A practical demonstration of the effectiveness of isolation is found in an investigation of the sales resulting from two Saturday "specials" offered by a store in newspaper advertisements. A salad bowl normally selling for 10 cents was offered at two for 15 cents in a space, 20 per cent of which was white. Men's hose with the same normal price and the same reduction were advertised surrounded by 70 per cent of white space. Normal sales were computed by averaging the records of the three Saturdays before and after the experiment when the articles were sold at the normal price. The advertisements were run on Thursday and Friday, the positions in the newspaper being interchanged. Sales records on the test day showed a 250 per cent increase over normal for the salad bowl and a 309 per cent increase for the men's hose, indicating the superior pulling power of the greater amount of white space.<sup>12</sup>

### *Illustrations*

Pictures speak a universal language. To most people they are basically more interesting than a written or verbal description. Because of their widespread appeal, illustrations represent one of the most potent devices for attracting attention. Almost any grotesque, startling, or aesthetically pleasing illustration is sufficient to draw the reader's eye to the advertisement, regardless of the product or the rest of the copy.

However, the illustration which merely attracts attention has not served its possible functions completely. A well-selected picture may facilitate memory for the advertised product, especially if the picture is relevant or can be quickly related to the main copy idea. The reason for the special memory value of relevant pictures can be understood in view of the fact that any illustration of the product in use, or any picture visualizing some significant feature of



the advertising message, is easily integrated into a single organized unit, including the copy and trade name. The total impression created by such a layout is such that any part of that layout may serve to recall the rest. Thus, when the reader subsequently sees the product on the store shelves, in the display window, or in the hands of some purchaser, his memory for the selling message is at least partially refreshed.

If the illustrations are irrelevant, this close organization of materials does not take place and the desirable enhancement of memory for the trade-name is not achieved.

Working on the assumption that successful advertising devices survive and unsuccessful devices are discontinued, it is instructive to notice the trend in the use of pictures over the past thirty years. Fig. 35, based on an analysis of 20,294 advertisements from

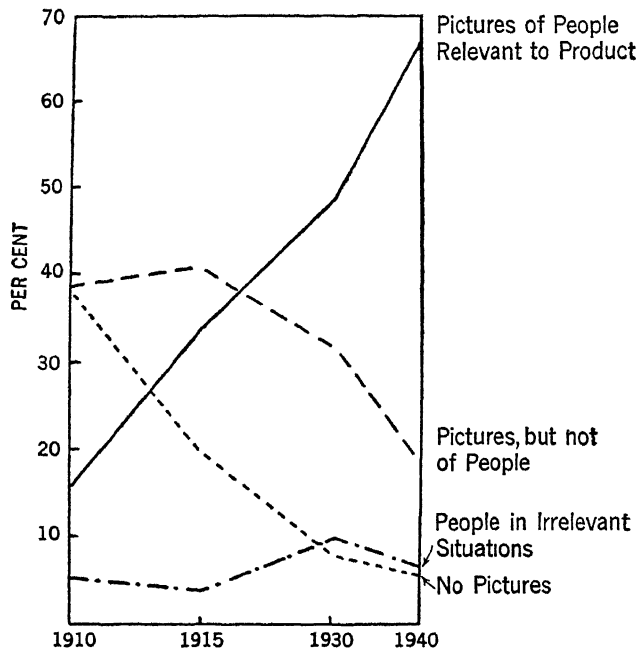


Figure 35. Showing Percentage Trend in Pictorial Content of Advertisements Adapted from O. E. Klapp, "Initiation Value in Advertising," *Jr. Appl. Psychol.*, 1941, 25, 243-250.

*Saturday Evening Post*, *Literary Digest*, *Time*, and *Colliers*, shows the marked increase especially in pictures of people using, demonstrat-

ing, or in other ways being functionally relevant to the product.<sup>13</sup>

In addition to their attention-getting and memory functions, pictures may often be employed to aid in describing a commodity or a special feature that could not be made clear in any other manner. In such a role they not only make easier the task of description but moreover lend a tone of authenticity to the whole, especially if photographs rather than drawings are used.

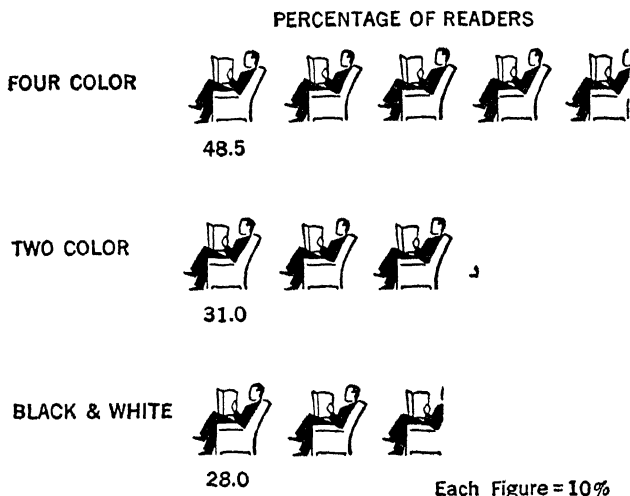
Returning to the attention-getting qualities of illustrations, it is of some interest to note that animate objects prove in general to be more attractive than inanimate objects. The automobile advertiser consequently adds to the attention-getting qualities of his illustration by surrounding the car with an admiring group of people. Other manufacturers of inanimate materials may go to rather extreme lengths to include attractive women handling, inspecting, or merely displaying the advertised commodity. Furthermore, pictures showing action are usually superior for advertising purposes in contrast to the portrait type of illustration. The attention advantage of both the animate and action pictures probably is rooted in a general preferential interest in living, moving things.

### *Color*

Closely related to the question of illustration is the companion feature of color. The development of four-color printing and more recently of color photography has, of course, influenced the frequency of their use in advertising. These factors alone do not account for the growing popularity of color advertisements. A great many instances are on record in which colored advertisements "out-pulled" black-and-white copy of identical form. For example, a mail-order house made up half its catalogs with, and half without, color plates. The former brought about fifteen times as much business as did the black and white. A dress-pattern distributor regularly made up about ten times the number of patterns that were sold with colored pictures of the model, as those that were placed in uncolored envelopes.<sup>14</sup>

The Starch surveys of readership, along with other indexes, have shown the greater attractiveness of color layouts, especially those using four rather than two colors. The accompanying figure shows the average percentage of readers who, when interviewed, stated

they had seen full-page advertisements. The data are broken down to show the average percentage for black-and-white, two-color, and four-color advertisements in the magazines listed. In every



*Figure 36.* Showing Effect of Color on Readership of Full Page Advertisements. Each Value is the Median Percentage of 10 Groups, Each Group Being Typical Readers of 10 Popular Magazines. Data Supplied through Courtesy of Daniel Starch & Staff, Consumer Magazine Report, May 1942.

case the four-color spreads were seen more frequently than the black-and-white, the median value for four-color layouts being about twice as great as for black-and-white advertisements.

An examination of the frequency with which color has been used in magazine advertising shows in the following figure a steady increase up to 1930. After that a reaction set in, but again in the late 1930's color began a new climb in favor.

Theoretically, at least, there is a saturation point beyond which the use of colored advertisements may defeat its purpose. That is to say, a colored layout achieves its attention value largely because it stands out in contrast to the duller black-and-white spreads. On the other hand, if a magazine should contain a very high percentage of colored advertisements, the black and whites would then become the exception and would probably gain greater reader attention. The above figure suggests that present practice may have reached that point, since the curves have not markedly exceeded the levels attained ten years ago. Moreover, in at least

some of the recent surveys of readership, the best read advertisements in particular issues of a magazine have been black-and-white layouts.

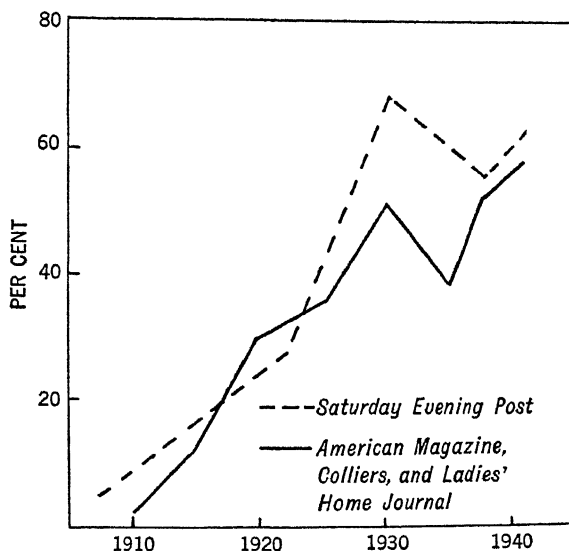


Figure 37. Showing Percentage of Full Page Advertisements That Were Colored. Adapted from H. E. Burtt, *Psychology of Advertising*, Houghton Mifflin Co., 1937, 242, and Data Collected by Students under the Author's Direction.

If this hypothesis should prove true in subsequent studies, then the advertiser must give even greater consideration to the wise selection of colors rather than merely to whether he shall or shall not employ color. He must consider which colors will give the best returns. A number of studies have indicated that the best contrast and consequently the highest degree of legibility is obtained with black figures on a yellow background. Other color combinations, ranked in order of their legibility, are:

- |                    |                                |
|--------------------|--------------------------------|
| 1. Black on white  | 6. White on green              |
| 2. Yellow on black | 7. Green on white              |
| 3. White on black  | 8. Red on white                |
| 4. Blue on white   | 9. White on red                |
| 5. White on blue   | 10. Red on green               |
|                    | 11. Green on red <sup>15</sup> |

#### 4. APPEALS

The appeal of an advertisement is the general theme or "core idea" which it contains. Psychologically, the appeal serves at

least two functions: it affects the attention qualities and the persuasiveness of the advertisement. Because of this dual role, a discussion of appeals may well serve as a transition from attention devices to some of the later material.

### *Long- vs. Short-circuit Appeals*

For a long time it has been customary to divide all appeals into two groups: first, those most closely related to the well-nigh universal and unlearned primitive urges of biological man, and second, those that spring from man's intellect and reason. The first have been called the "short-circuit" appeals because the responses they motivate often occur quickly and vigorously. The second, or "long-circuit" appeals are "reasons why." They seek to lead the prospect through a reasoning process by supplying technical information, statistics, and the like, attempting thereby to bring about a reasoned belief in the superiority of the advertised product. Copy stressing feminine allure, health, popularity, bargains, epicurean tastes, play, avoidance of danger, and similar deep-rooted emotional desires are examples of short-circuit appeals. Specifications of the product, statistics on the number of contented consumers, the performance record of the company, and like copy represent examples of long-circuit appeals.

It is quite natural to enquire, "Which of these types of appeal is superior?" Framed in this general way the question cannot be answered. It has been previously mentioned that devices successful in selling one commodity cannot always be applied to others, even within the same competitive field. A number of writers hold to the opinion that short-circuit appeals are most appropriate for the ordinary convenience and semiluxury articles that are relatively inexpensive and purchased with a minimum of deliberation. In this area are foods, tobacco products, drinks, soaps, cosmetics, toilet articles, dress accessories, safety devices, and similar products contributing to enjoyment and personal well-being. Long-circuit appeals are held to apply best to expensive luxuries, investments, and supplies that tend to protect capital outlays. Automobiles, lubricants, building materials, machinery, and tools fall in this class of goods. Hence, according to this point of view, each kind of appeal has its own area of usefulness.

Attempts to verify this opinion through laboratory studies or readership surveys have not been successful. The laboratory approach to this question is perhaps too artificial since usually subjects have been asked to indicate which appeal they think is the most potent in the abstract (that is, divorced from any specific product); or they have been required to rank samples of copy in order of their persuasiveness. This kind of procedure ignores the subjects' hesitancy to admit the importance of some appeals partially tabooed. Moreover, opinion regarding the most persuasive or best attention-holding appeals may not be related to the motives really involved in buying the product.

Studies of the relative effectiveness of appeals through readership surveys of actual advertisements are complicated by the fact few layouts make use of a single appeal. Even if one were to select from any magazine a list of advertisements using only short- or long-circuit appeals in "pure form," these spreads would differ in a great many other respects (size, position, color, illustrations), making it difficult, if not impossible, to discover the influence of appeal alone. In fact, many advertisements make use of both long- and short-circuit appeals, resulting in what some have called a "rationalized" appeal.

### *Rationalized Appeals*

The rationalized appeal takes advantage of the prevalent human tendency to act on the basis of primitive motives and then justify the resulting actions in intellectual or logical terms. Bill Smith may justify his purchase of cigars at four-for-a-dollar on the grounds that inexpensive cigars disagree with him, contain more nicotine, or make his breath exceedingly unpleasant. Actually, his fundamental reasons may be that they flatter his ego, make it possible to seem prosperous in the eyes of his friends, or enable him to find some point of unique similarity between himself and Winston Churchill.

The rationalized appeal is a combined short- and long-circuit. In some cases the illustration or heading suggests emotional or sensuous gratification but goes on to give "reason why" in the rest of the layout. The automobile advertisement may picture the glories of the open road, the style and flash of the car, but the

copy may emphasize economy or mechanical virtues. The recent trend toward vitamin copy in food advertising is another example of long-circuit appeal combined with an obvious primitive urge. A large part of the published advertising outside of technical journals is a mixture of long- and short-circuit appeal.

### *Negative vs. Positive Appeals*

It is possible to classify appeals in another way. Positive appeals are those which present a desirable condition to be attained, while negative appeals are those presenting conditions to be avoided—"scare copy" to the advertiser. The halitosis campaign of Listerine is an example of negative appeal. In the same class are the insurance advertisements picturing the tragedy of widowhood complicated with poverty, or the serious consequences of an auto accident if the driver is without financial protection. Positive appeals are easy to find and are quite obvious.

Again, which of these two types is superior? The answer must be similar to that given when dealing with long- and short-circuit appeals. Some commodities are much better adapted to one type rather than the other. Most safety devices or protective services can be effectively advertised with negative appeals. The only study designed to compare positive and negative appeals with the same products used coupon returns as a measure of effectiveness. The advertisements were paired so that in the case, for instance, of two toothpaste layouts, one used negative and the other positive appeal, but in other respects (design, position, size) they were approximately the same. The products advertised included toothpaste, food-drinks, breakfast foods, sanitary articles, and educational courses. A tabulation of the total number of advertisements favoring one form of appeal revealed no important advantage for either type. In other words, with these products either type of appeal can be applied with apparently equal success, assuming that coupon returns are a satisfactory measure of advertising effectiveness.<sup>16</sup>

### *The Choice of an Appeal*

The practical task of selecting an appeal for a given campaign is quite difficult in view of the foregoing facts. In addition to the considerations already mentioned, the copy writer must bear in

mind the occupational and economic features of his potential readers. He must consider the literary tone of the particular media in which the copy is to appear so that his words will fit the prevailing styles. Finally, the choice of an appeal must depend upon two interlocking factors: first, the features of the commodity which the potential consumers really consider in buying the product, and second, the features of the product which are good advertising possibilities. Hotchkiss presents the following example to show how these two considerations may affect a campaign:

Suppose a market investigation on packaged bran shows that the consumers' choice depends primarily upon taste. It would nevertheless be a mistake to rely upon an appetite appeal in advertising a brand that was distinctly inferior in taste quality. Not only would the claim of deliciousness be misrepresentative, it would also increase the disappointment of consumers who tried it and found it tasteless. The advertiser here would be well advised to use the health appeal, even though this were known to be a less influential buying motive. Better still would be the policy of deferring advertising until the product could be brought closer to the wishes of the market and thus justify a taste appeal.<sup>17</sup>

## 5. PRODUCING CONVICTION

Advertisers appear to have taken the attitude in the past that one of the best ways to convince the prospective buyer is to describe the virtues of one's product in superlative terms. The motion-picture industry has been especially prone to such a practice. This tendency has been so prevalent in the past as to bring charges that advertising stretches the truth beyond the breaking point. No problem has harassed the advertising business so persistently as this question of truth in advertising copy. In other words, what can the advertiser truthfully say about his product and still convince the prospect? Some copy writers have taken the attitude that the public will automatically discount a large percentage of what they read or hear in advertising. Therefore, in order to get over the truth, the facts must be exaggerated.

The practices resulting from this point of view were so objectionable in the early part of this century that a reaction set in within the advertising business itself to curb unethical claims and fraudulent copy. Certain government agencies also placed brakes



on similar practices. While some advertising is still without criticism in this regard, the situation is much improved over what it was twenty-five years ago. Essentially, however, the whole problem was brought on because the advertiser failed to understand the psychology of conviction and failed to use devices appropriate to its development. What are some of the practices that enhance conviction, that establish a belief in a product?

### *Specific Information*

Indefinite generalizations carry less conviction ordinarily than specific information. One layout carried the heading: "One-half of all the Packards are bought by people who previously owned medium-priced cars." Later a more specific statement appeared: "A recent investigation covering 2700 sales selected at random shows that one out of three had previously owned cars costing less than \$1500." Another layout showing a map and photographs of houses located on the map, included the words: "Here in Neighborhood S-2 are 27 Petro & NoKol Users. They save \$74 apiece every year on painting and papering and their fuel bills are \$81.72 lower." This copy was consistently rated superior by homeowners to a more grandiose but less definite heading that read: "Trust the testimony of 20,000 Petro & NoKol Users. Housecleaning costs cut by \$6 to \$194 every year. Fuel bills alone average \$38 less."<sup>18</sup> Both of these examples indicate that some sort of impartial survey has been made. A great many advertisers are discovering that consumer studies are not only valuable in providing opinions on the salient virtues and defects of their products, but in addition they provide specific information that aids in convincing prospective buyers.

Related to the matter of specificity is the use of photographs rather than drawings in creating confidence. Although it is not entirely true that pictures cannot lie, a photograph bears a stamp of authenticity which may be lacking in drawings where the artist has considerable freedom to idealize his subject, emphasizing this or that feature as his purpose dictates.

### *Testimonials*

Testimonials are ancient devices that have not always been judiciously employed to create confidence in one's product. Their

effect rests upon the quite human tendency to accept the recommendations of friends or important authorities when experience with the commodities is limited. It is common knowledge now that most testimonials for extensively advertised products are purchased, and seldom represent the spontaneous sincere opinion of the one whose name is attached. For this reason, endorsements by persons in the public eye have lost some of their advertising value. Some kinds of potential buyers are still influenced by testimonials. These people gain some slight satisfaction in using the same kind of lipstick endorsed by Gloria Screen Star, or in eating the same kind of meatpie served at the Brown Derby. In this way unattractive Mary Smith and hard-working Joe Jones become a little more like the people they admire. In using the goods endorsed by famous people they may at least partially identify themselves with them.

### *Atmosphere—Indirect Suggestion*

The setting, the atmosphere, in which a commodity is placed suggests indirectly certain of its qualities. Instead of advertising the famous names who used Ford cars, the illustration may picture a sport model drawn up in the parking space of a swank country club. The heavy-duty truck is shown hauling a huge loaded trailer over the brow of a hill. A pancake-flour advertisement carries a jocular cartoon illustrating "The treat that can't be beat at the pancake supper." Such an atmosphere is in marked contrast with the layout of a soup advertisement showing a well-appointed table, set with crystal goblets, gleaming silver, gardenias, blue and gold-edge china, and a tureen filled with steaming vegetable soup. These layouts suggest, without saying so, the quality and luxury even in the small car, the stamina and ruggedness of the truck, the simple homey goodness of the pancakes, and the delicate deliciousness of the soup.

A number of elements combine to produce the over-all tone of the advertisement, including the copy style (slangy, conservative, stilted, homey, humorous, childish); the kind of illustration (photograph, cartoon, line drawing, each with or without color); the style of type (Old English, American Typewriter, News Gothic, Cheltenham); the degree of complexity in the total layout.

Each of these features deserves more discussion than is possible within the limits of the present chapter. The important psychological point in this connection is that people tend to accept the indirect suggestions created by the atmosphere. At least they fail to question the suggestion that the vegetable soup is enjoyed by people of discriminating, expensive tastes. Had the copy carried a blunt statement to that effect, readers would likely become skeptical.

### *Consumer Tests of the Commodity*

A technique growing in popularity as a means of developing conviction and belief is to invite the reader or listener to "smell the freshness in Swan Soap"; "Conduct your own blindfold test and discover for yourself how good this coffee can be"; "Put Fresh No. 2 under one arm—put your present non-perspirant under the other." Even though the buyer may never conduct the home tests suggested, the feeling is created that the commodity must be superior otherwise the advertiser would hesitate to suggest the test. Such copy leaves the impression that the buyer himself can easily discover the commodity's virtues without being told. The sincerity of the advertiser may be further impressed by offering in the same layout a free trial sample so that the test does not appear to be a ruse to sell the customer just once. It is, of course, important from the standpoint of the advertiser, that the suggested tests be simple, inexpensive, requiring only a short time and no special skill. Otherwise the customers may feel that the advertiser is attempting to hide some defect behind the confused complexity of the experiment.

## 6. MAKING ADVERTISING STICK

Only a small part of the total advertising bill is spent on "point of purchase" materials. Consequently, in the vast majority of advertisements it is necessary to impress the reader or listener so that he will remember the trade name when the opportunity for buying presents itself. By what means can the memory value of an advertisement be improved? How can one make the copy stick?

### *Repetition*

Whenever the topic of memory improvement is introduced, repetition is one of the first devices to suggest itself. So far as ad-

vertising is concerned this means that the trade name and the selling message must be presented as frequently as the budget and other considerations permit. Reminder copy, previously referred to, depends for whatever effect it has on the principle that those trade names frequently encountered will be remembered better than those which are seldom experienced, other things being equal.

The effectiveness of this principle in advertising has been the subject of several laboratory studies, leading to the general conclusion that repetition of a given advertisement does enhance the memory for it but not in direct proportion to the frequency of the repetition. The increase in memory value lags behind the frequency. For one representative study<sup>19</sup> a dummy was made up in which some advertisements appeared only once, others twice, and others four times. Subjects looked through the dummy at their usual rate and then were asked to write down the advertisements they could recall. Taking the number of recalled advertisements appearing only once as the standard of comparison, those repeated twice were recalled 20 per cent more frequently and those repeated four times had a 45 per cent advantage. Hence, instead of getting a 400 per cent increase in memory with four presentations in comparison with a single layout, the increase was only a relatively small fraction. The suggestion has been made, based upon such studies, that memory for advertising increases in proportion to the cube root of the number of repetitions.

This laboratory study and others like it are perhaps less to the point than some of the investigations made with regularly published advertisements. Many of these latter investigations are somewhat difficult to interpret because of the vast number of complicating factors other than repetition, which are beyond control. Although there is general agreement among advertising executives that reasonably continuous advertising is more beneficial than spasmodic campaigns, these same people are in some disagreement as to the value of repeating identical copy. On the one hand are those who hold to the proposition that a reader tends to ignore advertisements which are similar to those he has previously seen. In support of this contention is an unpublished study conducted under the author's direction which showed that college students heartily dislike certain "station break" commercial announce-

ments on the radio which always present the same theme with almost no variation. There is, further, the study of Thorndike<sup>20</sup> on the effect of mere repetition on learning—the study which showed repetition alone had no beneficial effect (see Chap. II, page 37). A practical demonstration of this negative influence is found in the fact that very few people can recall the name of a man which appears on every Western Union blank, in spite of the fact that it has been before the public since 1916 and has been printed some five billion times.

On the other hand, some old advertisements have appeared time and time again without change and still draw more inquiries than other copy designed as improvements. The Alexander Hamilton Institute has used a layout for ten years with the heading, 'Men who 'know it all' are not invited to read this page.' The Sherwin Cody School of English continues to use copy that has not been changed in fifteen years. It is quite evident that some advertisements, like some foods, can be served repeatedly with good results. But we have yet to discover exactly what combination of favorable features makes the layout worth repeating.

Between the two extremes—keeping the copy the same and making it endlessly different—is the prevalent practice of incorporating in the advertisements of a given commodity a certain continuity or similarity by means of using essentially the same layout form, the same kind of illustration, and the same kind of type. After seeing the first few in a series and discovering the trade name, one's memory is quickly refreshed in seeing the later advertisements.

In commercial radio announcements the principle of repetition is readily observed in those cases where the trade name or commodity is mentioned several times. Considerable skill is necessary to weave the trade name into the announcement at numerous points without creating monotony or antagonizing the listeners. Repetition of the trade name with some variation in its context is without doubt necessary for advertising results. Those advertisements which have continued to pull business in spite of their repetition in identical form probably reach new prospects each time they appear. In any case, they constitute such a small fraction of the total advertising space as to be exceptions to the more general findings.

*Direction of Association*

Everyone has more difficulty in reciting the alphabet from Z to A than in the normal order. There is every reason to believe that if one originally learned the alphabet in the Z to A order he would have difficulty giving the A to Z order. Learning is normally a unidirectional process. In rote memorizing, the order in which the items appear determines the order in which they are most easily recalled. The application of this principle to advertising becomes apparent when one considers the normal order of thinking that precedes buying. Usually one is confronted with a need (hair tonic, toothpaste, hotel accommodations, breakfast cereal) and then searches for specific products that may satisfy that need. Reduced to bare outline, the order of thinking is commodity—trade name.

It is unfortunate for the advertiser that the English language normally places the modifiers before rather than after the nouns, forcing him to give the trade name first, followed by the commodity, as in Royal typewriter, Knox's gelatine, Plymouth automobiles, Parker pens, Utica sheets. In a few cases it has been possible to place the commodity first, followed by the trade name, thus taking advantage of the normal direction of thinking, as in Body by Fisher, Hotel Statler, and Hats by Knox. Some advertisements fit in with this principle by emphasizing the need in the heading or lead line followed quickly by the trade name. The outstanding words in one layout were, "What you should do when winter's in the wind," and at the bottom in larger type appeared, "Antiphlogistine." The radio announcer suggests, "When headaches bother you take Bayer's Aspirin" and a full-page spread reads, "To Boost Your Popularity Rating Take a Woodbury Facial Cocktail." The advertiser takes advantage of the normal order of thinking when he presents the need or general class of goods first, followed by his brand or trade name.

*Trade Names and Trade-marks*

Well-selected trade names and trade-marks possess important memory values. Trade names that are short, pleasant-sounding, easy to pronounce, and suggestive of the product are easy to recall. Basically, of course, the trade name is a device of convenience,

enabling the buyer to indicate exactly what he wants without the necessity of describing the product or package in detail. The housewife does not ask for "that cereal in the large white and green pasteboard box. You know what I mean, that flaky, brownish yellow stuff that's crisp and has little bubbles all over it. The flakes are made from corn, somehow or other, and are about the size of a nickel, but are thin and curled up in irregular shapes." Instead she merely says, "Kellogg's Cornflakes, please." Not only do customers hesitate to ask for goods with difficult-to-say trade names for fear of mispronouncing them, but such terms are difficult to remember. Compare "Antiphlogistine" with "Rel;" "Hexylresorcinol" with "S.T. 37;" "Canada-Dry" with "Clicquot Club;" "Guerlain" with "Evening in Paris." As in the last pair, a longer name, if easy to say, is superior to the short name. However, one- or two-syllable words are easier to remember than longer terms, other things being equal.

Based on the assumption that people are more likely to recall and create for themselves pleasant rather than unpleasant experiences, trade names with pleasant sounds or connotations have at least a theoretical advantage over their less agreeable competitors. It is difficult to demonstrate this advantage in existing products because of the great differences in advertising among competing brands. Some names that seem to be favored by this factor are Nylon, Swan, Teel, Kleenex, Sunkist, Drano, Bisquick, Flako. In the opposite category are Duz, Squaw, Lemon Squash, Swamp Root.

So far as trade-marks are concerned, the suggestion has been made that their memory value can be enhanced by using shapes which are easy to name. If one were to act upon this suggestion in choosing a trade-mark, he would be confronted immediately with the limiting fact that few shapes are easy to name and these have already been used by well-established firms. Moreover, it is important that the trade-mark be distinctive and unique so that it may not be confused with existing marks. A case in point is the trade-mark of the National Biscuit Company, on which several million dollars have been spent for publicity, but few people can recall what it is, while other companies have frequently imitated it.<sup>21</sup> In approximating this symbol, competitors have adopted a decid-

edly inferior mark from the standpoint of memory value and have robbed it of some uniqueness by the imitation. Quite apart from the legal question, to imitate a symbol that few people recall is surely unwise.

A large majority of companies have adopted pictorial symbols as trade-marks, in harmony with laboratory findings that show marked superiority in memory for pictures over mere geometric forms. In making a pictorial selection with an eye to a long future, the picture should not be "dated." Otherwise, after much money has been spent to establish the picture as a symbol it may become necessary to change the trade-mark to avoid the implication that the product is out of step with modern living. Good pictorial trade-marks that have avoided the "dated" look are the Eskimo boy of Clicquot Club, the Dutch woman of Old Dutch Cleanser, the chick and eggshell of Bon Ami, the flying horse of Mobile Gasoline.

The only thing approaching a trade-mark in radio advertising is the theme song or signature. In some cases the commercial announcer's voice serves as a trade-mark, especially, if as in most national broadcasts, the announcer is associated with a given sponsor for a long time. With the development of television there will undoubtedly be a closer tie-up of published advertising with radio, in some cases perhaps using large copies of the trade-mark as a back drop for the main action taking place before the televisior.

## 7. PRODUCING ACTION

"The best-looking merchandise won't sell itself; and the prettiest dotted line won't sign itself, without the intelligent persuasion of somebody's words."<sup>22</sup> This quotation serves to emphasize that one of the important aims of advertising is to produce some action on the part of the prospect. From the advertiser's standpoint, the most desirable kind of action is buying action. However, other kinds may also bring benefits in the long run. It will be recalled from the opening chapter that manipulation of materials helps to enhance memory for them. Hence, devices for producing action may culminate in a sale or, lacking that ultimate achievement, may have the desirable effect of facilitating memory for the brand name.



*Contests*

Contests serve both these ends admirably; first, as direct stimulants for increased sales, and second, as a means of increasing memory value for the trade or brand name. The fact that every contestant must at least write the name of the brand or sponsoring company tends to impress that name in the minds of the respondents. Some contests have made use of "the best letter describing why you like (*brand name*)"; others require the contestant to construct words out of the letters of the brand name. This kind of action unquestionably goes far to increase memory for the product.

The amount of interest in contests may prove surprising to those sophisticated people who look upon them as trite pastimes. During the depression of the early '30's when leisure time was plentiful, contests probably reached a peak in popularity. The Old Gold contest in 1937, from the standpoint of coverage, was perhaps the most outstanding, drawing over two million contestants who spent in postage alone more than a million dollars. Even though sales of Old Gold cigarettes skyrocketed during the contest, the company failed to hold the new customers thus obtained. Other contests have, however, been quite successful as a means of introducing a new product, especially when the preliminary testing has revealed its acceptability by the buying public. Occasionally one discovers a company using contests almost continuously. For the most part, in spite of their value in establishing general familiarity with the trade name, contests are used sparingly and with great caution for a number of reasons.

First, most contests have more losers than winners. There is the very real danger of creating greater ill will than good will. This danger was offset in a Forhans Toothpaste contest by offering an inexpensive Secret Ink Writing Kit to all entrants, thus assuring everyone something for his trouble. Second, it is difficult to estimate the effectiveness of the contest in advance so as to balance the prize money and other costs against the ultimate benefits. In this connection, it has been observed that the amount of prize money is of secondary importance to the basic theme of the contest. One that is interesting, that catches the public fancy, may outpull another contest less interesting but offering more valuable rewards.<sup>23</sup> Third, advertising a contest is likely to detract from advertising

the product sponsoring the contest. If the contest is to gain contestants it must be featured in at least some of the copy, thus diverting attention to what is essentially a secondary matter.

### *Direct Suggestion*

Some advertising, especially short radio commercial announcements, make use of direct suggestion as a way of stimulating action. The transcription declares, "Dentyne gum is spicy and delicious. It's only a nickel. Buy some today." The Minute Man poster carries the simple statement, "Buy War Bonds and Stamps." Another spread says, "For Comfort—Go Pullman." Direct suggestions of this kind are lacking in subtlety but have the advantage of conveying clearly what the advertiser wants his prospect to do. On the other hand, direct suggestions often arouse antagonism and negativism, at least among Americans who have a tradition of freedom and a resentment against authoritarian dictation. It is possible that in countries more accustomed to rigid regimentation through the practices of dictators, the direct type of suggestion may be more effective than in this country.

### *Indirect Suggestion*

A large number of specific devices have been developed for stimulating action indirectly. The illustration may show people using or buying the commodity with evident satisfaction. An automobile advertisement pictured the man of the house giving the keys of a new car to his wife as a Christmas present. Another carried the heading, "Put your wife's initials on a Buick sedan." An illustration for a beverage advertisement showed the bottled drink set in a tray of ice in the midst of other attractive dishes containing salads, hors d'oeuvres, and sandwiches. The heading declared, "How to blend more man-appeal into buffet suppers." The picture of a golden yellow tobacco leaf with a shadow showing through it was accompanied by the line, "Lucky Strike means fine tobacco." A liquor spread reads, "Pour Glenmore. You get more." Another suggests, "For your throat's sake switch from 'hots' to Kools." An extremely polite advertisement shows a uniformed door man opening the limousine door for a gentleman dressed in formal clothes. The heading reads, "Beg pardon, Sir, but may I

suggest . . .” Numerous variations on the whispering advertisement have been employed. These all purport to reveal a confidential opinion passed from one person to a second about a third, as, “Mary, did you notice how rough and hard Edith’s hands are?” or, “How Judith learned the truth—accidentally.” In these cases action is suggested indirectly or subtly by suggesting either the solution to a problem or a kind of action that presupposes the prospect will buy the advertised product.

On the level of direct selling the salesman may make use of indirect suggestion by asking the housewife, “Would you like to have the vacuum cleaner with or without the attachments?” instead of asking merely whether she wants the cleaner or not. Questions of this kind hurdle the question of Yes or No and go on to the question of How much? suggesting that the prior question has already been settled in the affirmative.

### *Facilitating Action*

Some advertisements fail to pull the inquiries they otherwise would because little effort is made to facilitate action. A good number of advertisements carry coupons so small as to be not only inconspicuous but also inconvenient to use. In some cases they are placed near the binding rather than near the outside border of the magazine, making it difficult to cut them out. The spaces provided for name and address often are cramped so that a prospect may find it impossible to write the necessary data legibly and for that reason will not submit the request. A survey of the average signature length and the average space provided in coupons for signatures indicated that only 20 per cent of the coupons in the full-page, standard-size magazine advertisements provided space as long as or longer than the average signature length. For half-page advertisements practically none of the spaces equaled the average signature length.<sup>24</sup> A repeat survey completed by the writer shows essentially the same conditions existing in coupons twenty years after the original study was published.

In addition to making the coupon large enough to use easily, it may be surrounded by a broken line with a picture of a pair of scissors poised in such a way as to draw attention to the coupon and suggesting that the coupon be clipped. If some choice of

premiums is involved, this can be facilitated by printing the choices with small boxes to be checked rather than requiring the respondent to write out his choice.

Direct-mail advertising sometimes makes use of a return self-addressed, "no-stamp-required" post card with even the respondent's name and address typed upon it. This reduces the respondent's trouble to a minimum, requiring him merely to check his order and drop the card in the mail.

If premiums are offered as a sort of opening wedge for a future sale rather than as a bonus for previous buying (return of coupons collected from packages), the appropriateness of the premium to the principal product for sale is an important consideration. For example, a box of soap flakes was offered with a kitchen dish cloth in one campaign and later the purchase of the same soap entitled the buyer to a glass tumbler. The second was less closely associated with the main product. Certainly, each time the dish cloth was used there was greater likelihood of using the soap than when the tumbler was used. In one limited area another soap manufacturer offered tickets to the state fair with each purchase of three cakes. The buyers of soap might temporarily stock up on the premium-carrying brand but the tickets provided little or no basis for future purchases of that same brand. On the other hand, the baking-powder or flavor-extract manufacturer who offers measuring spoons for the cook is providing a reminder and suggestion that when the present stock is exhausted the same brand should be reordered. Appropriate premiums facilitate buying action.

## 8. SUMMARY

This chapter has shown how the business objectives differ from and are related to the psychological objectives of advertising. The factors of size, position, isolation, illustrations, and color have been considered in terms of their attention-getting qualities. A distinction was drawn between long- and short-circuit appeals, pointing out that in practice considerable use is made of rationalized appeals. On a somewhat different basis appeals have been classified as negative and positive. Specific information, photographs, appropriate atmosphere, and informal consumer tests have been discussed as aids in convincing prospective buyers of the prod-

uct's virtues. A number of techniques have been suggested to increase the memory value of advertisements, among them being repetition, the product-trade name order of presentation, the nature of the trade name and trade-mark. Finally was discussed the problem of producing action through contests, direct and indirect suggestion, the use of coupons and related premiums.

## 5. PSYCHOLOGY APPLIED *to Crime*



# Chapter 14

## FACTORS CONTRIBUTING TO CRIME

Crime is a big business and a huge waste, diverting from more useful channels the time and energies of a staggering number of law-enforcement officers, jailors, lawyers, judges, and legislators. Psychologists along with others have applied their skills in an attempt to halt this social waste. This chapter will examine the principal contributing factors to crime. For simplicity the discussion throughout the next four chapters will consider primarily the habitual, as contrasted with the casual offender. Laws and institutions often fail to distinguish between those who through ignorance or accident commit unlawful acts and those who are criminal because: (*a*) it is their business: dope peddlers, gangsters, counterfeiters; (*b*) they fail to control their passions: drunks, wife-beaters, rapists; (*c*) they oppose the established order: anarchists, revolutionists, saboteurs, and (*d*) they are moved by strange obsessions and compulsions. These four classes of nonaccidental criminals will be the primary concern. By way of introduction two points must be emphasized. First, that criminals are largely the product of the social forces into which they are thrown, and second, that statistical studies of crime frequencies are complicated often by invalid indexes of criminal activity. Each of these points merits some detailed treatment.

### 1. INTRODUCTION

#### *Criminals Are Made—Not Born*

In years past a prevailing notion among a large number of laymen and scientists alike was that criminals were of a peculiar biological type, largely impervious to reeducation; criminals have



been pictured as prolific progenitors of depraved children. These ideas took definite shape in the interpretations that Lombroso, the Italian criminologist, placed on extensive measurements of prison populations. According to this investigator, the criminal can be recognized by a number of physical stigmata such as asymmetrical cranium, long lower jaw, flattened nose, scanty beard, low sensitivity to pain. The theory that criminals were born such, also received support in the study of infamous family trees such as the Jukes, Kallikak, and Zero families. The Kallikaks, for example, had 480 descendants from an illegitimate mating of a Revolutionary War soldier and a feeble-minded woman, of whom 3 were convicted of felonies, 3 were epileptic, 36 were illegitimate, 8 kept houses of ill fame, 24 were confirmed alcoholics, and 33 were sexually immoral. There were no known criminals among the descendants of the same soldier and a normal wife. It looked as if criminal tendencies were inherited.

Within recent years students of criminology have either reinterpreted or added to the findings of Lombroso and the genealogists of criminal families. Anthropological measures of law-abiding citizens have revealed no significant differences between them and criminals, as a group. However, Hooton has compiled statistics which suggest that tall thin men tend to murder and rob; tall heavy men tend to kill, to forge, to defraud; small thin men tend to steal and burglarize; and short heavy men tend to commit assaults and sex crimes.<sup>1</sup> However, note the word "tend." The differences between the criminal groups are much smaller than the individual differences within any single group. Consequently the criminal cannot be detected with certainty by examining his physique. He is not a distinct biological type. Furthermore, there is no justification to conclude that criminality is inherited because it appears in successive generations. Simply because men have worn ties for generations is no basis for assuming that tie-wearing is an inherited behavior pattern. The upshot of these arguments is that criminals, generally speaking, are such primarily because they have been subjected to influences during their lifetime which encouraged criminal behavior. Criminologists who have examined dispassionately the published researches no longer contend that criminals are born and not made.

*Crime Statistics*

A second point must be remembered before discussing the precise psychological causes of crime. Indexes of crime rates vary in their accuracy, none being absolute measures of crime frequency. The reasons for the unreliable nature of most crime statistics are not difficult to discover. First, laws defining crimes are undergoing constant modification, sometimes making comparisons between one decade and another a hazardous undertaking. Second, indexes based on arrests, convictions, or commitments to prison are not measures of the amount of crime committed. For example, out of a thousand consecutive burglaries and robberies of chain-grocery stores in Chicago in 1930-1931, only two resulted directly in arrests.<sup>2</sup> Third, crime frequencies are of little use unless they are stated in proportion to the population in which the crimes were committed, or to some other base. For instance, convicted violations of motor-vehicle laws in Michigan increased from 1566 in 1912-1913 to 27,794 in 1931-1932. The ratio of convictions to the number of cars registered, however, dropped in those same years from .0287 to .0225.<sup>3</sup> Fourth, "crimes known to the police" are not necessarily accurate measures of crime frequency. One investigator found that the number of shoplifting cases known to three Philadelphia department stores was greater than the total number of thefts of all kinds in the entire city known to the police.<sup>4</sup>

If one is aware of these difficulties in crime statistics, the studies dealing with the psychological causes of crime can perhaps be more wisely evaluated. In spite of their varying degrees of reliability, the various indexes of crime provide something more than straws in the wind and are indispensable if even tentative conclusions are to be drawn concerning the factors affecting crime frequencies.

## 2. ENVIRONMENTAL CAUSES

*Economic Status*

A considerable number of criminologists, psychologists, and others concerned with criminals have stressed the importance of economic status as an indirect causative factor. In this connection Sutherland makes the following observations:

In the city poverty generally means a low social status, with little to lose, little to respect, little to be proud of, little to sustain the efforts at self-advancement. It means bad housing conditions, lack of attractive community institutions. It may mean that both parents are away from home during most of the waking period of the children, and are burdened with fatigue and irritation while they are home. It generally means that the child is withdrawn from school at the earliest permitted age, to enter mechanical and unskilled labor which is not interesting or remunerative and which offers few opportunities for advancement. It is surprising in view of these conditions that any of the poor people remain law-abiding.<sup>5</sup>

Most of the statistical studies which have been made of this problem are concerned with juvenile delinquency, although the few dealing with adult offenders are in substantial agreement. A study, for example, of delinquency rates and financial aid to families per square mile of area gave a correlation coefficient of  $+ .74$ ; the number of delinquency and dependency cases being correlated to the extent of  $+ .82$ .<sup>6</sup> Another investigation found that more than 86 per cent of women delinquents in New York State were reared in homes classified as either poor or very poor.<sup>7</sup> Both of these studies indicate a rather close relationship between low economic status and criminal or delinquent behavior.

Another approach to the problem has been through the examination of measures of general economic conditions over a period of years and the concomitant crime rates. The following table has been compiled from such a study made in Philadelphia.<sup>8</sup> It shows a highly significant relationship between burglary and the indexes

Table 16. Correlations between Economic Indexes and Arrests  
for Serious Crimes, 1925-1934

	<i>Crimes against Property</i>		<i>Violent Attacks against Persons<sup>a</sup></i>
	<i>Total</i>	<i>Burglary</i>	
Wage payments	— .066	— .940	+ .540
Cost of living	+ .003	— .922	+ .595
Retail trade	+ .026	— .955	+ .616

<sup>a</sup>Exclusive of rape.

of economic conditions such that crimes of this kind are more likely to occur in periods of depression. The reasons for this rela-

tionship and the lack of any appreciable correlation of economic conditions with other kinds of crime against property are obscure. A still different picture is presented when one observes the relation between violent attacks and economic conditions. This kind of crime is somewhat more likely to occur in periods of relative prosperity, although the size of the correlation is smaller than in the case of burglaries. Neither the author of this study nor the present writer can hazard a guess as to the reasons for these conflicting relationships. They merely serve to emphasize the intricate ways in which economic factors may operate.

It is still an open question whether living in the low economic strata causes criminal behavior, or whether low economic conditions and criminal behavior have a common cause—perhaps a cause that can be found in an examination of personalities. It may be that poor success in the economic struggle and consequent drifting to slum neighborhoods is a reflection of inadequate motivation, lack of intellectual capacity, poor occupational training, or a twisted and distorted emotional life. These same factors in various combinations could conceivably be causative agents in criminal behavior as well.

Belief in the inexorable influence of socioeconomic conditions on criminal behavior is further shattered by studies of delinquents and nondelinquents in the same family. One such investigation included families in Boston, New Haven, and Detroit, from each of which one delinquent and one nondelinquent child was selected for intensive study. Here were two groups of children almost exactly matched in terms of age, sex, and social opportunities, but differing markedly in one factor: their delinquent behavior. It is true that few of the families were living under conditions favorable for well-adjusted social behavior. However, 55 per cent of the children in these unfavorable families were nondelinquent.<sup>9</sup> In a less well controlled but more extensive study of urban delinquency areas, only 23 percent of the children in the worst sections appeared in the juvenile court.<sup>10</sup> While this percentage of delinquents is regrettably high, it still indicates that a large proportion of reasonably well-adjusted juveniles manage to resist degrading influences. On the other hand, complete elimination of poverty would not completely eliminate crime.

The relation, therefore, between economic status and criminality is a complex one. Studies of the gross statistics of prison commitments or other indexes of crime and economic status show a positive relationship. It cannot rightly be concluded from this that low economic status is the necessary cause of high criminal rates.

It is of course, pointless to argue that any single factor is the cause of such a complex phenomenon as human criminality. Instead, many factors contribute to the production of criminal behavior. The point in the past few pages has been to deemphasize socioeconomic conditions as direct factors determining criminal tendency and to turn the spotlight upon the important fact that subtle psychological factors are often masked by economic conditions that are easy to see. It is certainly true that poor socioeconomic conditions alone are not sufficient to account for high criminal rates. Certain ill-defined psychological conditions appear to be causal factors as well. A more extended discussion of the important psychological factors will be developed in a later section.

### *Occupation*

Occupational conditions affect principally the type of crime committed rather than the gross frequency of offenses. It is perfectly evident that professional persons find themselves more frequently in positions where embezzlement, forgery, fraud, and certain forms of grand larceny are possible than does the unskilled, itinerant workman. The latter, however, are more likely to be convicted of vagrancy, illegitimate parenthood, abandonment of children, non-support, and physical cruelty. The differences which are observed in this connection largely reflect merely differences in criminal opportunities.

### *Home and Marital Status*

The system of loyalties, ideals, and attitudes which an individual absorbs in the casual contacts in his home during the early years of his life is probably a very important factor in determining subsequent behavior. The net result of the ideals, attitudes, prejudices, and loyalties held by adults in so far as individual criminal behavior is concerned, depends, of course, upon the degree to which they harmonize with the ideals, attitudes, and loyalties of the

community. In other words, children tend to adopt the modes of behavior of those near them. If the modes of behavior are contrary to the codes of the community and are therefore criminal in nature, the children tend to become criminal also. This is the essential mechanism accounting for the so-called inherited criminality of the Kallikaks, Jukes, and Zeros mentioned earlier in this chapter.

Home conditions may operate in two other ways to produce criminal behavior. First, the physical, social or psychological "climate" may be so unpleasant within a noncriminal home that the individual is forced to seek his satisfactions elsewhere. His separation from the integrated family group does not necessarily produce delinquency but does increase the possibilities of associating with delinquents, especially in urban communities. One clear-cut form in which this separation takes place is through running away. Slawson studied a group of delinquents in which 54 per cent had run away from home, a figure that is higher than one would expect in an unselected population of similar economic and cultural status.<sup>11</sup> Second, both oversolicitous and irresponsible parents may fail to provide training that enables the individual to solve satisfactorily his extrafamily relationships. That is to say, the young man or woman who has been protected and sheltered from opportunities for making decisions will find adjustment to community relationships difficult. In the course of making this adjustment he may stumble upon criminal solutions. In like manner, the young person without sufficient home training presents a greater potential criminal risk than one whose home discipline has been more normal.

It is somewhat difficult to evaluate the importance of the second of these processes in contributing to criminality. There is no satisfactory way of discovering the oversolicitous home except through individual case investigations. Even with this method, interpretations of the observations may differ.

Homes broken by divorce or separation are frequently those that have been established by irresponsible parents, although not invariably. Statistical studies of the percentage of delinquents from broken homes are not in precise agreement. The percentages range from 40 to about 70, clustering around 50. These percentages

include homes broken by death as well as other causes. The number of broken homes among the nondelinquent population is, of course, smaller, but here again there is considerable disagreement with respect to the exact difference in percentage. One study<sup>12</sup> showed 30 per cent of the delinquents came from homes broken by death and 16 per cent from homes broken by separation, while among the control nondelinquents the percentages were 17 and 1, respectively. If this study is representative, it suggests a significant effect of irresponsible parenthood on the production of delinquents.

These studies leave no doubt that the broken home is a factor associated with delinquency, but how important a factor it is, is still debatable. The further question as to the particular process by which broken homes may produce delinquency is even more difficult and can be answered at present only by rational processes almost entirely unsupported by statistical studies. However, there is no evidence contradicting the deductions made above.

Not only do broken homes and especially those broken by separation contribute heavily to delinquency, but the marital status of adults bears a similar relationship to adult offenses. According to the statistics for the year 1923 the rate of commitment to prisons and reformatories per 100,000 population of the same marital status was highest for the divorced and lowest for the married. The rates for single and widowed persons were between these extremes.<sup>13</sup> It is reasonable to suppose that a good part of the excess rate of divorced over married criminals can be accounted for by the unstable, emotionally charged home conditions of the divorced persons. As pointed out previously, these same conditions appear to be associated with a significant proportion of delinquency.

It may be that the home which is broken, as far as the legal or sociological definition is concerned, is not so important a source of crime as the psychologically broken home. Parents whose relationships are characterized by bickering, jealousy, stern and severe discipline untempered by understanding and sympathy, unwittingly encourage delinquency in their children. The breaking of such a home would probably be an ameliorating influence.

At present there is no satisfactory way in which to count the number of psychological broken homes except through case inves-

rigations of those that come to the notice of public agencies. Those that presumably exist but do not produce delinquency or criminal behavior are uncounted. We have no direct way, therefore, of evaluating the influence of psychologically broken homes even though *a priori* considerations lead us to suppose they are definitely deleterious to satisfactory community behavior.

### *Motion Pictures*

The effect of motion pictures on crime frequencies has more frequently been a topic of debate than of investigation. A few studies, however, have been made, such as that reported by Hartshorne and May,<sup>14</sup> showing that deception scores for children attending movies more than four times a week are higher than the deception scores of children attending movies only once a week. Case studies, particularly of juvenile delinquents, have frequently revealed that offenses or particular methods of executing a crime have been suggested by certain motion pictures. Such cases suggest the futility of examining the effect of motion pictures *in toto*. The theaters of a community present a wide variety of subjects differing in their moral standards and implications. To expect the conglomerate products of Hollywood to have a specific effect is unreasonable. Hartshorne and May's data which seem to be a contradiction of this conclusion may be due to some third factor or group of factors with which both movie attendance and deception are connected.

A more satisfactory approach would seem to be the study of particular motion pictures. Peterson and Thurstone<sup>15</sup> have made such an examination of the effect of several specific motion pictures on the attitudes of school children. One picture dealing sympathetically with the Chinese produced a significant change in the group attitude toward these Orientals, an effect that was still noticeable but diminished nineteen months later. This study suggests the potency of motion pictures in molding attitudes not only toward the Chinese but toward crime and other social problems. The extent to which motion pictures are effective in this respect depends to a very large degree upon: first, the specific subject matter of the picture, and second, the artistic effectiveness of its portrayal. Specific motion pictures have unquestionably



contributed to crime as revealed by case studies. The number of such pictures and the extent of their influence are unknown quantities.

### *Radio and Newspapers*

The precise influence of these media of communication on criminal behavior is unknown also. Like the motion pictures, radio programs have potentialities for good and evil. Crime serials such as "Gang Busters" have met with considerable heated opposition from parent organizations and educators without much effect. Again, the alleged deleterious effects of such programs have revealed themselves only in specific cases of delinquency. It is reasonable to expect, however, that serials with a crime theme are likely to suggest unwholesome modes of behavior or engender unfortunate attitudes of bravado and dare-deviltry. Even in the face of inconclusive evidence, it would seem safer to discourage crime serials on the air particularly at those hours when children are likely to account for a large percentage of the audience.

Newspapers, through elaborate, detailed accounts of criminal offenses, may exert a suggestive influence on some members of the general population and thereby contribute to crime frequencies. The psychological mechanism here, however, is essentially the same as with the radio, motion pictures, and crime magazines of the "pulp" variety. In addition, newspapers have been accused of a number of specific practices that contribute to crime. In the first place, they have in many cases given undue advertising to the Number 1 public enemies. An unimportant gang of petty racketeers was dubbed the "Purple Gang" by a Detroit newsman in one of his reports. The deeds of the gang were subsequently magnified in other newspaper accounts. The net result was to increase their ability to cow their victims into financial submission.

Second, the public press has interfered with the apprehension and conviction of criminals. Several instances are on record where advance information on the plans of the police to surround a given area or investigate a given clue have aided the criminals to escape. One of the most tragic examples of this kind of interference occurred in the Peter Levine kidnapping case. One of the ransom notes threatened death of the child if the newspapers or police

were informed. A reporter received a tip that the child had been kidnapped and required some confirmation before the paper would print the story. He called up the Levine home representing himself as an agent for the kidnappers and got his confirmation. The paper printed the story. The child was later found dead. The kidnappers have never been apprehended.

These criticisms of the newspapers and radio are not blanket condemnations but merely point to particular practices that seem contrary to the welfare of the community. These practices are not indispensable to the existence of either the radio or newspaper enterprises.

### *Climate*

Climate has been an indirect factor in the production of certain kinds of crime. High temperatures are supposed to increase the number of crimes against persons, while low temperatures are said to increase crimes against property. In the first instance, it is assumed that the emotional unrest and general irritability produced by high temperatures are conducive to crimes such as assault and battery which show a marked peak in August and a minimum in December. The natural barriers to the easy acquisition of food, warm clothing, and sufficient shelter in winter probably account for the increase in crimes against property during cold weather. At the same time it is claimed that cooler temperatures are an aid in maintaining nervous and mental equilibrium,<sup>16</sup> thus inhibiting crimes of violence.

In this connection some interesting observations have recently been reported concerning the influence of the Föhn, a violent warm, dry wind with sudden shifts which sweeps through the Alpine valleys in the spring and fall. The direct effects are feelings of malaise, irritability, sleepiness, mild depression. There is also a loss of skill and working capacity. During the Föhn there is an increase in traffic accidents, suicides, and crimes that originate in irritability and aggression.<sup>17</sup> It is quite apparent that climate as such may influence crime frequencies, either by inducing emotional tensions that may find release through criminal actions or, as is the case with "cold-weather crimes," by increasing the difficulty of satisfying elementary biological needs.

*Concluding Statement*

The environmental influences which have been discussed are not to be thought of as irresistible forces determining the road to crime. They merely encourage, suggest, or are conducive to criminal behavior. Some persons born in the midst of squalor of criminally inclined parents and with virtually every chance against finding a satisfactory niche in the community, still manage to evade serious conflict with the law. It seems reasonable that these people should be psychologically different from others of like disadvantages who compile a long court record. The evidence collected in the succeeding pages leads to the belief there are definite psychological differences between criminals and noncriminals.

### 3. PERSONAL FACTORS

*Age*

Age appears to be one of the important factors determining the frequency and kind of crime committed. The age of maximum criminality has been variously placed between eighteen and twenty-eight years. Without depending unduly upon any one study, it can justly be concluded that the age of maximum criminal activity lies somewhere in young adulthood. One explanation to account for this fact assumes that the recklessness, characteristic of youth, is untempered by forethought bred of experience. In support of this contention Sutherland states that the age of greatest frequency of robbery (about nineteen years) is approximately the same as the age of greatest frequency of automobile accidents per thousand licensed drivers, although the modal age of one thousand murders studied in New Jersey was considerably higher (between twenty-five and twenty-nine years).<sup>18</sup> This explanation is probably as satisfactory as any other, if it is enlarged upon somewhat by saying that throughout the years from ten to twenty the individual is forced more and more to make adjustments directly with "the law." The school and home where parents or teachers may act as buffers between the individual and the law decrease in their importance during this decade. Minor infractions go unnoticed or unpunished until minor offenses calling for a court's reprimand and dismissal become the rule. Later, it becomes a game to

beat the cops; to do a big job. The process of "criminal maturation" requires time, and in our present social organization the time most frequently required places maximum criminality in early adulthood. Obviously, older people do not engage in criminal activity so much as the younger because: first, a number are serving prison terms; second, some have been influenced by punishment procedures to "go straight," and third, some have lost the skill, daring, or physical strength demanded by certain types of crime.

Many of the more emotional and less factual social reformers have within recent years been decrying the alleged fact that youth is becoming more criminally inclined. They point to the low ages of murderers, robbers, and others in prisons and penitentiaries. Examination of prison statistics fails to show any marked decrease in the average age of convicts over an extended period of time. In one state prison the mean age of criminals at admission was 32.4 in 1900 and 31.5 in 1930. In another state prison the modal age at admission was 23 in 1894 and 24 in 1924.<sup>19</sup>

*A priori* considerations would lead us to expect some decrease in the age of criminals, even if the actual age of maximum criminal behavior remained the same. In the first place, law-enforcement agencies have increased in extent and effectiveness particularly with respect to juveniles. A greater proportion of juvenile offenses are probably now receiving the attention of public officials than in former years. In the second place, the average age of many other occupations has decreased. In spite of these factors operating to lower the age of criminals, the available information shows no marked change.

It has been asserted on occasion that the juvenile delinquent of today is the adult criminal of tomorrow. The statistics on this question have at times appeared to be contradictory, but a careful examination of the data shows no real difference. On the one hand is the finding of the Gluecks<sup>20</sup> that 88.2 per cent of one thousand juveniles recidivated within a five-year period following the end of official treatment by the Boston Juvenile Court, the mean age of the group at the end of the period being twenty years, eleven months. On the other hand, the Massachusetts Commission on Probation found that only 20 per cent of the men between seventeen and twenty years of age brought before a court had previously appeared as

delinquents in juvenile courts.<sup>21</sup> If any contradiction appears in these data it is purely superficial. They merely mean that a large proportion of juvenile delinquents continue to come in conflict with the law as adults, but only a small percentage of the adult criminals were formerly juvenile delinquents. The following diagram illustrates the relationships, assuming that the two studies are based on comparable populations.

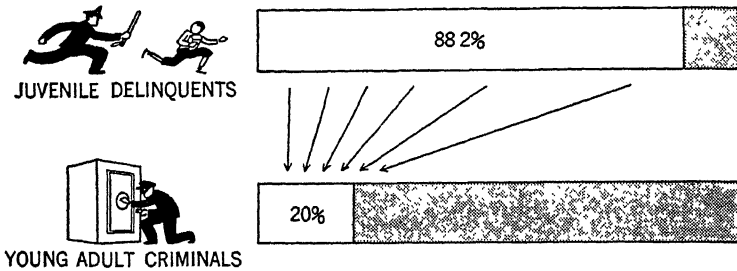


Figure 38. Showing Approximately 88 Per Cent of Juvenile Delinquents Later Make up About 20 Per Cent of the Adult Criminals.

A somewhat similar study showed that 92.5 per cent of 116 problem children in the Berkeley, California, schools became delinquent or criminal within an eight-year period following their discharge from the school guidance bureau.<sup>22</sup> Complementing this is the finding that 95.4 per cent of the delinquents whose childhood activities were known to the Gluecks had seriously misbehaved prior to the arrest which brought them to the Boston Juvenile Court.<sup>23</sup> In other words, recidivism seems to be characteristic of juvenile delinquents even when subjected to guidance procedures. It, therefore, seems true that the problem child or juvenile delinquent of today may very likely be the criminal of tomorrow, but it cannot be concluded that the criminal of today or tomorrow was necessarily the juvenile delinquent of yesterday.

### Sex

Sex differences in the number of convicted criminals have led some to conclude that women are less criminally inclined than men. Fourteen times as many males as females were committed to all types of penal and reformatory institutions in 1933.<sup>24</sup> When these statistics are broken down into the kinds of crime for which sen-

tences are imposed the supposed greater criminality of the male becomes less impressive. In a Chicago department store 82 per cent of all shoplifting cases apprehended were female. Women are convicted of sex offenses more frequently than men. This finding, however, is an artifact since both sexes are usually involved. Crimes for which males are arrested more frequently than females include burglary, robbery, homicide, larceny, forgery, and embezzlement. Examination of these findings leads one to suspect that the greater number of male convicts largely reflects the greater criminal opportunities of men. The existing social system gives to the male a greater range of occupational opportunities, forcing women, in spite of recent great strides toward sex equality, to be the dependent sex. Consequently, women tend to remain in the home, relatively isolated from the immediate demands of securing a livelihood while the men are called upon to find that livelihood either by lawful or unlawful means.

Two kinds of evidence support the conclusion reached in the above paragraph. Hartshorne and May's studies of school children showed no clear-cut significant sex differences in deception.<sup>25</sup> Moreover, in offenses such as shoplifting, boys and girls under sixteen years are apprehended with about equal frequency. It is apparent that at these early ages the stealing proclivities of both sexes are uninhibited by the obligations later imposed by the social system.

Some differences do exist between the sexes even as juvenile delinquents. The most obvious difference is again in terms of the number of cases coming before juvenile courts. The United States Children's Bureau reported about six times as many boys as girls were referred to sixty-eight such courts in 1932.<sup>26</sup> The percentage of boys was markedly higher than the girls for burglary, other stealing, and acts of mischief or carelessness. A greater percentage of girls were referred because of running away, being ungovernable, and sex offenses. These differences between the sexes of juveniles are less than between the adults for offenses of a similar nature, a fact that supports the contention that some of the sex differences in crime are attributable to differences in criminal opportunities.

### *Intelligence*

When intelligence tests were new and the doctrines of Lombroso

were still in favor, a goodly number of criminologists and psychologists were agreed that low intelligence was a major contributing factor to crime. Representative of this body of opinion is the following quotation:

Every investigation of the mentality of criminals, misdemeanants, delinquents, and other antisocial groups has proven beyond the possibility of contradiction that nearly all persons in these classes and in some cases all, are of low mentality. . . . It is no longer to be denied that the greatest single cause of delinquency and crime is low-grade mentality, much of it within the limits of feeble-mindedness.<sup>27</sup>

The early studies of criminals showed that between 20 and 50 per cent of the prison populations were below what was then considered the normal mental age. When the psychologists testing the recruits for the United States Army in 1917-1918 compiled their data and found the average mental age of the white draft to be about 12.5 years, some revision was obviously necessary in the concept of the normal mental age. This also entailed a revision in the definition of feeble-mindedness. In the years following World War I, a number of studies of the mentality of adult criminals were completed that were contradictory in their interpretations. For example, Adler<sup>28</sup> concluded the proportion of feeble-minded among the criminal population was about equal to the proportion in the general, noncriminal population. Murchison<sup>29</sup> concluded the proportion of feeble-minded among the criminals was less than among the general population, while Erickson<sup>30</sup> thought his data indicated more feeble-minded among the criminals. This confusion was more apparent than real since the definition of feeble-mindedness differed from one study to another. Zeleny<sup>31</sup> has since reanalyzed the original data of Adler, Murchison, and Erickson, using a constant criterion of feeble-mindedness. All cases with a mental age of less than eleven years were designated feeble-minded. The ratio of feeble-minded in the criminal to the noncriminal populations for each of the original studies was then shown to be 1.2:1. In other words, the feeble-minded contribute only a few more convicts than should be expected from their number in the general population. Studies of intelligence among criminals have often failed to control the factor of socioeconomic status. Many of the investigators have suggested that if criminal and noncriminal pop-

ulations of the same socioeconomic strata were compared, the percentage of low-grade intellects in the former would not be excessive.

In evaluating these studies the unreliability of prison statistics must be borne in mind. They do not indicate the amount of crime committed. It may be that criminals of above average intelligence escape arrest or conviction more easily than those of subnormal intelligence. Moreover, some states have been relatively successful in separating the feeble-minded criminals from those of normal intelligence. The feeble-minded convicted of minor offenses are sometimes placed in institutions along with the noncriminal feeble-minded. In these states a study of the prison populations alone would be indecisive.

So far as juveniles are concerned, there seems to be general agreement that delinquents are consistently below normal in intelligence. The following table quoted from Louttit<sup>32</sup> summarizes a number of scattered studies on this point:

*Table 17. Showing Average I. Q. of Juvenile Delinquents*

<i>Author</i>	<i>Description</i>	<i>Average I. Q.</i>
Burt	197 boys and girls	89
Healy and Bronner	4000 delinquents	90
Merrill	236 juvenile court cases	82
Armstrong	660 runaway boys	78
	1379 New York Children's Court	73
	553 New York House of Refuge	78
	400 Whittier State School for Boys	92
	407 Indiana Boys' School	89

This brief summary of the pertinent information on the relation between intelligence and crime indicates that the adult convicts as a group are only slightly lower than the general population. The difference between the noncriminal and criminal populations in intelligence is somewhat more marked in the case of juveniles. This shift of criminal intelligence with age may mean again that the feeble-minded delinquents are caught early in life and the more intelligent evade apprehension until later.

### *Mental Disorders*

The situation with respect to the number of mentally disordered persons among the criminals is in a rather sad state of confusion.



Like the problem of the feeble-minded a few years ago, the standards of diagnosis vary with the diagnostician. This is one reason for the "battles between the experts" in some criminal trials where insanity is proposed as a defense. A second reason for the differences in psychiatric testimony can be traced to a fundamental legal distinction between the sane and the insane which has no counterpart in fact. That is to say, the judges in the M'Naghten case<sup>33</sup> laid down the principle that an insane person is one who either does not "know the nature and quality of the act he is doing," or does not "know that what he was doing was wrong." In practice it is exceedingly difficult to determine whether a criminal at the time of the crime had sufficient mental balance to know the nature and quality of his act or recognized it as a wrong act. Moreover, the legal distinction assumes that the line of demarcation between the sane and insane is clear and unmistakable. The fact of the matter is that the vast collection of studies on psychological differences between individuals shows no sharp line of division between the sane and insane, but rather an "area of confusion;" an indistinct zone where some persons are placed whose diagnosis at best can only be provisional.

Added to these sources of confusion are the minor differences in state laws affecting a plea of insanity. In Florida temporary insanity due to emotional disturbances or intoxication is not accepted as a defense, and persons diagnosed psychopathic personality are held responsible. In Georgia the defense of insanity is seldom successful unless the average layman coming in contact with the accused can recognize the abnormality. However, in the state of Illinois psychopathic personalities may be declared insane while in Iowa, Massachusetts, Pennsylvania, Montana, Connecticut, and Ohio the plea of irresponsibility is considered an adequate defense.<sup>34</sup>

Probably the best method of determining criminal responsibility is through a three-month period of observation in a mental hospital. This procedure has been recommended because many mental disorders are of an episodic nature and are not clearly revealed in any other manner.

For these reasons there are no definite conclusions concerning the number of criminals who are mentally deranged. According to

reports from Massachusetts, where the Briggs Law provides for the psychiatric examination of certain of the more serious offenders, the percentage of criminals declared abnormal averages approximately 15 per cent per year.<sup>35</sup> An analysis of male first admissions to the Illinois hospital for the criminal insane between 1922 and 1934 revealed that they comprised only 13 per cent of the total male criminals sent to penal institutions in that state.<sup>36</sup>

There have been some who would classify virtually all criminals as psychopathic. To these people, criminal behavior itself is *prima facie* evidence that the individual is psychopathic even in the absence of any other symptoms of mental disease. If such a principle were adopted, then the concept of psychopathology would lose its distinctive descriptive and explanatory connotations and be reduced to a mere name. There is certainly no sense in declaring a man insane because he has committed murder, and then say he committed murder because he was insane.

In spite of serious limitations which the study of the criminally insane is subject to, it is known that some crime is undoubtedly traceable to abnormal mental conditions. Probably the most criminally dangerous type of mental disorder is paranoia. Fortunately, simple uncomplicated cases of paranoia are rather rare, constituting less than 0.25 per cent of the mental hospital population. The following case illustrates some of the characteristics of the paranoid person. Usually delusions of persecution and personal grandeur are intertwined with such logical finesse that the ordinary layman is frequently convinced of the individual's sanity.

A village schoolmaster, 39 years old, murdered his four children and his wife while they were sleeping; the following night he set fire to several houses in another village, where he had previously been a teacher, and was shooting at the male inhabitants, of whom he killed nine and seriously wounded eleven. As a boy he was easily insulted, ambitious, conceited. Later he had poetic plans for reforming the universe. His highly developed self-esteem had been deeply depressed by a futile struggle of many years against onanism. Later, under the influence of alcohol, he had let himself be carried away to sodomy and then had a dreadful feeling of sin, with incessant fear of contempt and arrest, which soon brought about the conviction that the inhabitants of the village knew of his crime and spoke about it. His accusations against himself he transferred

to his family; then his hatred extended to all mankind and above all to the inhabitants of his district who had treated him badly. Transferred in 1902 to another place, he enjoyed relative quiet for 6 or 7 years without, however, ever ceasing to build up further his delusional system. But then, according to his opinion, the remarks and contempt continued there also. The result was the plan, even then developed in every detail, to murder his family, as much because of reasons of race-hygiene as from pity, and then set fire to the village where he was first employed, to destroy it with all its hypocritical inhabitants. The first necessity was the extermination, the "redemption" of his children; but the revenge against and the contempt for the village occupied him no less. His wife he had to kill because of pity. For a person like him there were special laws. He had not only the right but the duty to do this. His plan was a "humanitarian matter." For four years he postponed the execution of his bitter task. But when he was later transferred to a third locality and there felt himself the center of barroom gossip, he executed his plan systematically.<sup>37</sup>

The paranoid individual with deep-seated delusions may exhibit sufficient cunning and intelligence to mask them at critical times and avoid commitment to an institution for custodial care. A school teacher accused a salesman of attempting to poison her; a colleague of disturbing her records; a mechanic of tampering with her car; an oculist of making "amorous advances." When requested to resign she contested the action on the basis of a state law giving tenure of office. At a public hearing she conducted herself normally and denied the charges so directly that the majority of the public heartily supported the state commissioner's order to reinstate her. Subsequently, she left her position without notice and was reported to have made violent attacks upon relatives and nurses.

A small percentage of criminals commit crimes from some compulsion. Typical among this group are the pyromaniacs (fire setters), and the kleptomaniacs (petty thieves). Not all persons who make a practice of setting fires or petty thieving are maniacs. The vast majority commit these crimes to gain some material benefit for themselves. The maniacs on the other hand merely gain some release from a "psychic tension"—a perverted appetite—in their criminal actions. The following cases are illustrative.

A series of fires broke out in a western city with such frequency and

persistence in a limited area that incendiarism was suspected. A youth was finally captured in the act of setting on fire a large office building. He was the son of wealthy parents, had recently married happily. He confessed to an irresistible thrill as he watched the flames mount.

An unmarried woman, forty years of age, employed as a stenographer with a modest income independent of her wages, was caught shoplifting a pair of gloves. Investigation revealed she had more than twenty-five pairs of assorted sizes, most of which she had stolen within a year. She "just loved gloves."

Alcoholism is a psychopathic condition responsible for some crime. It must be remembered that not all cases of intoxication are cases of alcoholism. The chronic alcoholic is usually one who resorts to drink as an escape from the unsolved problems and conflicts of his sober life. During the drunken stupor sensibilities are dulled and responsibilities are temporarily forgotten. Such persons very frequently show a periodicity in their drinking rather than imbibing small quantities at frequent irregular intervals. A draftsman who came to the author's attention had a rather unsatisfactory home condition from which he escaped every three or four months by taking a week's "vacation," during which he would spend as much money as he could lay hold of on liquor. During the interval between these debauches he might take an occasional cocktail at a party without feeling any urge to drink to excess. His excess drinking was unquestionably of a psychopathic origin.

There are no satisfactory statistics showing how many cases of intoxication are chronic alcoholic or how many alcoholics are criminal. Eighteen and seven-tenths per cent of one thousand convicted murderers in New Jersey were diagnosed chronic alcoholics.<sup>38</sup> In the State Hospital for the Criminally Insane at Matteawan, New York, nearly 17 per cent of the patients are diagnosed alcoholic.<sup>39</sup> These figures represent a considerably higher proportion of alcoholics than would be expected in the noncriminal population. Some homicides, robberies, rapes, and burglaries are committed under the influence of alcohol, but by and large the principal effects on crime frequencies are indirect. When the condition occurs in the lower income brackets, nonsupport and deterioration of the family is an almost inevitable consequence, resulting in conditions

previously discussed that are favorable to criminal behavior in the offspring.

From the psychological standpoint the same is true of drug addiction. The vast majority of the addicts begin their practices to escape from the unpleasantness of normal competitive living. Some, however, it must be admitted, become addicts through medical prescriptions or in searching for a "thrill experience" on the dare of some unscrupulous associate or drug peddler. It is a moot question whether those who become addicts through the latter methods were personalities peculiarly predisposed to retreating from the active struggle of normal life and accidentally find in the drug habit a convenient means of withdrawing. Whatever the explanation of drug addiction may be, the practices contribute little directly to lawlessness other than the lawlessness of violating the statutes concerned with the manufacture, distribution, and sale of the narcotic drugs themselves.

In addition to the conditions already discussed, other abnormal mental states have from time to time been associated with criminal behavior. Some violent attacks have been made during seizures similar to those found in epilepsy, during which there is clouding of consciousness and amnesia for the events of the crime. Delusions of a less systematized character than those found in paranoia are sometimes connected with cases of paresis, a disorder caused by the syphilis germ invading the central nervous system. These persons sometimes commit sex offenses under the delusion of their irresistible sexual attraction, or may engage in crude attempts at burglary, robbery, or grand larceny in the form of stealing automobiles. Their criminal careers are very likely to begin after young adulthood. Persons with manic-depressive psychosis are characterized by marked shifts in general emotional tone from elation, expansive ideas, and agitated activity, to morose, uncommunicative, and melancholic behavior. These people while in the manic phase may make violent attacks on other persons or wantonly destroy property. In the depressed phase the principal danger is that they may commit suicide.

Crimes committed by insane or perverted individuals quite probably constitute a small percentage of the total crime frequency. Crimes against persons probably involve a few more psychotics

or near-psychotics than crimes against property. The mentally abnormal criminal very often is good "news copy," either because of the hideousness of his actions or because of his eccentricities. Thus the public's conception of the number of deranged criminals is exaggerated beyond the facts. In spite of what has just been said, it is obviously good policy to protect society by taking the necessary steps to insulate all those with dangerous psychotic tendencies from opportunities for criminal actions.

Up to this point the discussion has dealt with specific conditions that are often associated with criminal frequencies. It will now consider the essential differences between criminals and noncriminals; delinquents and nondelinquents. Only through a careful study of demonstrable differences between such groups can a clear notion of the most important causative factors be gained.

### *Developmental History and Personality*

A number of studies using personality tests and questionnaires when taken in the aggregate give a rough picture of the personalities of delinquents and adult criminals. The existing evidence tends to show that delinquents are characterized by superficial interests, egocentricity, immature emotional development, neurotic tendencies, introversion, and feelings of persecution and insecurity (that is, being badly treated by the family).<sup>40</sup> The overlapping of delinquent and nondelinquent groups in these respects, however, is very marked so there is no justification in concluding that a given individual manifesting these characteristics will necessarily become delinquent, although the chances are good that he will.

Reference has been made to the illuminating studies by Healy and Bronner of delinquent and nondelinquent juveniles living in the same families. In the following table are presented some of the important differences between these two groups in regard to their developmental histories, school status, physical habits, interests, and personalities. A careful study of this table will help the student to build for himself an accurate composite picture of delinquents and how they get that way.

This table contains a number of surprises and many of the items need some interpretation. Consider, for instance, the items under

Table 18. Showing Statistics Concerning Delinquents and Their Nondelinquent Siblings (Controls)\*

(Note Total cases in each group, 105, unless otherwise indicated.)

<i>Development History: (100 pairs)</i>	<i>Delinquents</i>	<i>Controls</i>
Unwanted child	11	6
Much worried pregnancy	10	3
Very sickly pregnancy	13	6
Much under weight in early childhood	12	5
Cross, fussy babyhood	14	5
Difficult sphincter training	31	13
Many illnesses or severe illness	28	8
<i>Physical Habits at Time of Study</i>		
Food idiosyncrasies	13	6
Sleep idiosyncrasies	8	3
Excessive nail-biting, picking, etc.	12	7
Thumb-sucking	5	0
Other nervous manifestations	12	8
Individuals showing any of the above habits	44	24
Speech defects	7	1
<i>School Status</i>		
Markedly below grade or age-level on school achievement tests	20	5
Strong dislike of school in general	40	4
Regarded themselves as teased or unpopular at school	14	0
Repeated, often excessive truancy	60	0
<i>Personality Characteristics</i>		
Hyperactive, overrestlessness, etc.	46	0
Great urge for crowd companionship	31	11
Tendency to avoid companionship	16	23
Showing marked ascendant tendencies	28	6
Distinctly submissive tendencies	2	15
Normal emotional control	70	94
Marked feelings of inferiority	38	4
<i>Interests</i>		
Regular attendance at church or Sunday school	46	64
No church or Sunday-school attendance	12	8
Prior club connections	47	28
Scout membership	9	3
Marked interest in sports	73	57
Notable skill in athletics	15	8
Fond of reading	76	55
Regular—more than occasional—movie attendance	88	42

\*From Healy and Bronner, *op.cit.*, p. 73ff.

developmental history. Nearly all of these conditions occurring in early life are possible sources of irritation for the rest of the family, easily leading the older members to stigmatize the child as an "ugly duckling," thereby handicapping later adjustment. The ill-adapted physical habits and features of school status listed in the next sections of the table are not so much causes of delinquent behavior as they are manifestations of some basic insecurity, uneasiness, or want, that may be the root of the delinquent actions. A number of features frequently found in delinquents are the stuff from which good character and well-adjusted habits are made when properly directed: for example, the urge for crowd companionship, ascendant tendencies (required of all great leaders), membership in Scouts or other clubs, interest and skill in athletics, fondness of reading. The presence of these latter features in delinquents is encouraging to those interested in rehabilitation and reformation, for they indicate the delinquents are not as a group "bad to the core."

The most outstanding and revealing finding of this study is not included in the above table. It is a finding that may well serve to knit together the tangled, seemingly meaningless threads of evidence that have been presented in this chapter. The following is a quotation directly from these investigators.

It becomes evident from our data that there is practical value in a more penetrating interpretation of delinquency as a form of *rational behavior* just as dependent on definite causations as is any other form of behavior. In human beings there are urges, desires, and drives seeking satisfaction through various modes of self-expression—and delinquency is one mode of self-expression. . . . Seeking further it appears that at some varying distance upstream in the sequence of delinquent causation there are almost always deeply felt discomforts arising from unsatisfying human relationships. Herein we have found answer to one of our prime questions: why, living under the same environmental conditions, often inimical, is one child non-delinquent and the other child delinquent? The latter we almost universally found to be the one who at some stage of his development had been blocked in his needs for satisfying relationships in his family circle. On the other hand, the non-delinquent had nearly always been without any such acute frustrations. His relationships with those in his immediate social environment had been much more satisfying. . . . To view delinquency merely as an exhibition of vicious, naughty, or



irrational behavior is in utter contradistinction to the scientific standpoint that it has as much specific causation and possibility of being understood as any other manifestation of voluntary activity. The acceptance of a scientific orientation concerning causality is the best incentive to the attempt to discover the specific causes for delinquency in a particular case.<sup>41</sup>

The fact of family or parental rejection clearly revealed in the statistical studies of Healy and Bronner has been verified in numerous case studies made by psychoanalysts and clinical psychologists. Only recently, however, has this factor received the notice it deserves as an important, perhaps the most important, factor in the production of delinquency and possible later criminal behavior.

#### 4. SUMMARY

This chapter has treated the question of the factors contributing to crime frequencies. It has emphasized the environmental point of view rather than the theories of inheritance of criminality through certain definable biological types. At the same time, a number of reasons were advanced for questioning the validity of certain kinds of indexes which are used as measures of criminal behavior. The economic factor appears to be related to crime according to some studies, but extenuating circumstances throw some doubt on a direct causal relation between economic conditions and crime frequencies. A reasonable hypothesis was suggested to the effect that the relative economic station of people within the existing structure of society may be due to the same personality characteristics that determine criminal tendencies. The discussion of home influences indicated that the psychologically broken home may be more productive of criminal behavior both in adults and children than the home actually broken by death, divorce, or separation. There are no satisfactory statistics of the former type of home, but investigations have shown that those actually broken contribute more than their normal share of delinquents.

Motion pictures, radio, and newspapers have all been guilty of certain practices that encourage criminal behavior, at least in those persons who are already disposed to crime. The practices that are contrary to the public good are not indispensable to the operation of these enterprises and can be curbed with relative ease.

Climate seems to affect the kind rather than the frequency of crimes committed.

The processes of social organization apparently determine to a large extent the time required for "criminal maturation." In spite of current opinion to the contrary, the average age of convicted criminals does not appear to be decreasing, even in the face of several factors that operate to lower it.

Sex differences appear in the number of convicted criminals, the women having in general the lower crime rate. Marked sex differences also appear when particular types of crimes are examined, especially among adult populations. The fact that these differences become smaller in many cases as age decreases suggests that the observed sex difference is at least partly a reflection of differences in social environment and criminal opportunities.

Most of the recent evidence on the relation between intelligence and crime indicates that convicted criminals are approximately equal to the noncriminal population. Juvenile delinquents, however, appear to be subnormal as a group.

No clear conclusions can be drawn about the proportion of the criminals who are mentally abnormal. Some types of insanity predispose individuals to some kinds of crime. Those abnormal states characterized by delusions are particularly dangerous. Fortunately, the symptoms in many cases can be recognized in advance and appropriate steps can be taken to prevent criminal actions.

# *Chapter 15*

## TESTIMONY AND THE COURTROOM

Many of the assumptions concerning human nature accepted today by the law as a working basis were established through the legal pronouncements of eminent but ancient jurists before the science of psychology appeared. Legal interpretations of these assumptions have undergone some modification, but the law has been so conservative as to incite the charge from some within the profession that it is still operating in the Stone Age of legal evolution. Discrepancies between legal fictions and modern principles of human nature are clearly revealed by comparing the court rules of evidence and the psychological mechanisms called for in presenting testimony. It may be that one of the reasons for the current ineffectiveness of the legal machinery can be traced to these fallacious assumptions concerning man. Certainly no system of social control based on erroneous notions of human nature can long survive or discharge its functions readily.

In the pages that follow will be discussed the factors affecting the accuracy of testimony, pointing out the most obvious differences between legal and psychological evaluations. This chapter will deal with the sources of unintentional inaccuracies, leaving until later the discussion of deceit.

### 1. PERSONAL FACTORS AFFECTING OBSERVATION

It is perfectly obvious that accurate testimony in court will depend upon the accuracy with which the initial observations are made. The factors that creep in to distort the original impressions are related, on the one hand, to manifest sensory illusions and defects studied in general psychology. On the other hand, influences not generally recognized also account for some inexact observations.

*Sensory Factors—Vision*

The courts and the general public are for the most part aware of the common visual defects that may prevent clear observation. Nearsighted persons, when not wearing corrective lenses, cannot be expected to give unimpeachable evidence of events occurring some considerable distance from them, the degree of reliability depending upon the degree of defect. Conversely, farsighted persons have difficulty in making fine discriminations at distances within arm's length. Not often is the farsighted individual handicapped in giving testimony because of his defect, since most events contested in court take place at distances greater than arm's length.

Color blindness, occurring in about 4 per cent of the male population and in only about one-fourth as many women, is a condition that may distort some testimony without the witness being aware of his limitation. Some people with moderate degrees of color blindness, in which the reds and greens are distinguished imperfectly, have not discovered the fact until adulthood, even though presumably the defect has been present since birth. It is relatively easy to discover even a color weakness by means of the Ishahara test, which consists of a number of cards covered with colored dots. Within the dotted field a pattern of similarly colored dots forms a numeral ordinarily perceptible. The color-blind person either does not see the numeral or does see a pattern different from the one normally perceived.

The effect of illumination on visual acuity and also on color vision is an important consideration in evaluating testimony. It is well known that low degrees of illumination decrease visibility, but it is not so well known that the relative brightness of colors changes as illumination decreases. The brightest colors under ordinary daylight are the yellows. As illumination decreases at nightfall or in darkened rooms, the reds and yellows rapidly decrease in brilliance, while the greens and blues become brighter relative to other colors of the spectrum. It is therefore quite possible for a witness in all sincerity to testify apart from all other distorting influences that the accused was wearing a bluish-green jacket and a black skirt when actually the skirt was dark red. "False" testimony on one color under low degrees of illumi-

nation is no reason for striking out testimony concerning other colors.

The problem of illumination entered into a controversy between two taxi companies. The cabs of one company were painted white while the rival cabs were orange. The taxis could readily be distinguished during the day and under ordinary street illumination at night, but in areas flooded with illumination from reddish-orange neon signs the cabs appeared to be the same color. Consequently, not only must the degree of illumination be considered, but the quality is important also in evaluating testimony concerning colors at night.

Among the illusions that may from time to time distort testimony is the tendency to overestimate vertical and underestimate horizontal distances. Similarly, an unbroken line such as a wire or taut rope is usually judged shorter than an equal length of rope broken by vertical lines. An empty clothes line would appear shorter than one of equal length with clothes pins on it. "Unfilled" space (an open lot) is judged smaller than "filled" space (the same lot with a house on it). Long, perfectly straight lines which intersect with a series of short lines all set at the same oblique angle will appear curved rather than straight.

The visual estimation of speed is a factor causing much controversy at times. It is a well-recognized fact both by psychologists and the courts that estimation of speed is more inaccurate when the motion is directly toward or away from the observer than when motion is from right to left. This fact is particularly noticeable if one stands along a railway and observes an approaching train, comparing its apparent speed some distance down the track with the speed as it passes by. Practice or experience in estimating speed is recognized by the courts as influencing a witness's competency in giving such testimony.

Still other factors influence estimation of speed. In one study, twenty-nine subjects were asked to judge the rate at which automobiles passed a given point. The cars differed widely, varying from a small four-cylinder car to a large de luxe model. It was clear that the judgments of the observers depended upon the noise the car made, its size, and the rate of the car just preceding.<sup>1</sup>

*Auditory Sensations*

The chief difficulty with testimony involving auditory sensations lies in determining the direction from which sound comes. The ability to localize the source of sounds is very easily disturbed by echoes or large reflecting surfaces. For example, a witness was approaching a street intersection surrounded by buildings four to six stories high. As he was walking on the left sidewalk going south, some sixty yards from the intersection he heard a loud report which appeared to come from the intersecting street to the east. Upon investigation, he found the sound source was actually on the west. The false localization was attributed to the sound being reflected from the building on the opposite side of the street from the witness. It is possible to conceive of numerous situations in which testimony may be confused by such false localization.

In the absence of reflecting and echoing surfaces, location of sound sources is ordinarily reasonably accurate except for sound originating in the median plane of the body. By "median plane" is meant any point which is equidistant from each ear. The confusion in such cases is not in regard to its location to the right or left but rather as to whether the sound came from in front of or behind, above or below the observer. Gross inaccuracies of this magnitude are rare but do occur, particularly when the sound is unexpected and momentary.

The range of vibrations and frequencies which an individual can hear is occasionally of importance in testimony. Generally speaking, as people increase in age they become insensitive to the higher frequencies. From time to time, also, one may meet a witness with a "tonal island." Such an individual is insensitive to a small range of frequencies but can hear tones that are higher and some that are lower. Ordinary speech makes use of a great variety of vibration frequencies, so that an individual might have a tonal island and be as unaware of it as most people are unaware of the blind spot in each eye. It is conceivable also that a given warning whistle might produce just those frequencies to which the individual is deaf. Consequently, such an individual's testimony on the sounding of the warning should be considered inaccurate, even though his hearing in other respects might be quite normal.

*The Cutaneous Senses*

The cutaneous senses include touch, pain, heat, and cold. Ordinarily these play a minor part in testimony. In passing, it may be noted that the effects of contrast and adaptation are also found in other sense impressions but are of somewhat more importance in the cutaneous senses.

Contrast refers to the apparent enhancement of differences in experiences in the same sense field that occur either in rapid succession or simultaneously. Thus, a warm object may feel very hot to the hand if the individual has just previously handled something cold.

Adaptation refers to the temporary decrease in sensitivity that comes about either through a gradual change in the stimulating circumstances or through a prolonged exposure to a constant stimulus. For example, one is not ordinarily aware of the pressure of his clothing except when it is first put on. The tub of water may feel hot at first but as the skin senses become adapted, it becomes just pleasantly warm. Testimony about such experiences ought to be prefaced by statements concerning prior stimulating conditions.

*Taste and Smell*

Occasionally testimony concerning taste is of legal importance, especially in regard to accusations of poisoning. The principal inaccuracies in this area concern confusion of taste and smell. In reality there are, of course, only four primary tastes: sweet, sour, salt, and bitter. Foods which seem to be primarily fruity or burnt or something other than sweet, sour, salty, or bitter are really smelled rather than tasted. Prior tastes may also distort gustatory observations. Hence it is important when assertions are made about given tastes to know what was eaten or drunk previously.

*Expectation and Attention*

Human beings are not like wax tablets on which the experiences of the day leave their mark, as John Locke, the great English philosopher, once declared. Human beings are not passive recipients of stimuli, soaking them up like a dry sponge. On the contrary, a man frequently perceives what he expected to perceive even

though what he expected to perceive did not objectively occur. Moreover, interesting, important, significant events may take place within sight and within earshot but fail to impress the observer sufficiently for him to recall them two minutes later.

It has been reported that in the murder of President Carnot by the Italian, Caserio, not a single person saw the blow struck though the murderer jumped upon the footrest of the carriage pushed aside Carnot's arm, and thrust the dagger into his abdomen. In the carriage three other men were seated, two grooms were standing behind, mounted officers were riding on either side, yet no one saw the President stabbed. The murderer would probably have escaped had he not cried out fanatically while running away, "Vive l'anarchic."<sup>2</sup>

A great many informal classroom experiments have demonstrated the influence of attention and expectation on subsequent recall. For example, the author arranged to have a student walk into class late and interrupt the lecture by a declaration of having lost some white rats. He walked slowly across the room in front of the class, turned around, and went out, all the while carrying on a previously rehearsed conversation with the instructor concerning the loss of, and search for the rats. In spite of the fact that the student-actor was well known to the class, estimates of his weight ranged from 145 to 210 (actual weight 190); eight of the forty-three students declared he wore a maroon-colored sweater (actually he wore a grey-tan double-breasted coat); and a majority declared vehemently he searched in the corners looking for his rats (he made one furtive glance toward the corner of the room contrary to instructions to keep his eyes on the instructor). The reports on the sweater and his searching were at least partly due to expectation, the prevailing color of sweaters on this particular campus being maroon, while the searching was expected in view of the conversation.

From this experiment and others of similar nature, it appears that the witness gives conscious attention to items imparting meaning to the incident. Actions that appear irrelevant to the main course of the incident tend to escape notice. For instance, in another staged episode the entire group of twenty-one observers noticed the intruder remove handkerchiefs from a gun, but only eleven



observed him start to leave, turn back, and stuff the handkerchiefs in his coat pocket. At the time this action took place, the gun was in the possession of another "actor," thus diverting attention from the intruder.

Frequently a criminal case may turn on testimony relating to the time order of events. Did the victim of a shooting scream just before or just after the flash of the gun? Did the autos collide just before or just after the traffic lights changed? A number of studies indicate<sup>3</sup> that accuracy of judgment in such cases depends upon whether or not the sound source is in view, the time interval between the events, and the position of the observer relative to the events. Accuracy is greater when the sound source is in view and when the time interval between stimuli is at least one-half second. Of course, the more favorably situated the observer is to experience both events, the more accurate is his report. In addition, there seems to be among most people a predisposition to judge light or flashes as preceding sounds when they follow each other in very rapid succession. In other words, there are likely to be more errors in judgment when the real order is sound-flash than when it is flash-sound.

The Twitchell murder case in Philadelphia illustrates the effect of expectation on testimony.<sup>4</sup> The defendant killed his wife with a blackjack, dragged the body into the yard of their home, bent a poker, and covered it with blood in order that it might appear as if someone else had committed the crime. In order to give the impression that someone outside the house was the criminal, he unbolted the gate leading to the street and left it slightly open. In the morning the servant girl discovered the body, ran through the gate, screaming, and summoned the police. On the witness stand the girl swore that on the morning when the body was found she unbolted the gate as she usually did every morning when she came to work. Since the gate was the only way by which one could enter or leave the house, the girl's testimony forced suspicion on the husband, who was eventually convicted. Twitchell later confessed but insisted the servant's testimony was false. The girl's habitual actions had led her to expect to open the gate, thereby distorting her testimony.

Expectation also played a part in the testimony of some members

of a posse who searched for and later found the body of a young girl. Some members of the party testified they smelled burned flesh in the vicinity of the spot where the body was discovered. No corroborating evidence substantiated this testimony. Further investigation, however, disclosed that the witnesses had previously searched for another girl who had disappeared under similar circumstances and was found severely burned. Probably the similarity in the initial circumstances surrounding the disappearance led at least some to expect the second girl to suffer exactly the same fate as the first.

### *Emotions*

Considerable psychological evidence collected not only in the laboratory but also in direct observation of everyday happenings shows that observations made under the stress of excitement are notoriously inaccurate. Many common expressions are reflections of this fact; for example, "blinded by rage," "distracted by grief." Contrary to this is the legal principle that spontaneous exclamations made in the heat of emotion are admissible as valid indications of the contested events. As one authority on legal evidence puts it, "The excitement stills the reflective faculties and removes their control." Consequently, the exclamation is a "sincere response to the actual sensations during the period when consideration of self-interests could not have been fully brought to bear by reason of reflection."<sup>5</sup>

This legal principle seems to have operated to exclude at least some testimony which psychological considerations would lead us to accept without serious question. Statements of disinterested spectators relatively unaffected by the events have been excluded in favor of the statements of participants who were emotionally disturbed.<sup>6</sup>

The possible consequences of faulty observation and the influence of emotional disturbances on testimony are revealed in the account of the following murder.

At about 1:30 in the morning of January 7, 1929, Deputy Sheriff J. W. Dugan of Jefferson County, Missouri, was aroused by the ringing of his telephone. Lifting the receiver, he heard an anguished voice asking for help. It was Virgil Romine, at the Artesian Park Filling Station near

St. Louis, moaning that he had been shot and urging the sheriff to hurry over. In a few minutes the sheriff had reached the filling station. Shortly thereafter, L. H. Jones, owner of the station and the attached restaurant, and a physician arrived. They found Romine sitting in a chair in the restaurant suffering intensely and bleeding profusely from fresh bullet wounds in the abdomen. Perspiration was pouring from his face. Blood smears were on the floor. The furniture was flung around the room, indicating a violent scuffle. Romine in agony begged to be taken to a hospital.

Sheriff Dugan urged Romine to tell how he had been shot and who did it. The wounded man related that three or four men and a woman—all dressed in overalls and caps—stopped at the restaurant and ordered food. One, a tall, slim man, ordered a hamburger sandwich. When Romine went to the kitchen to prepare it, this fellow followed him and shot him. In the ensuing scuffle, Romine got his gun and tried to defend himself. His own wounds were so grievously painful that he did not know what followed. Romine added: "I can't tell you their names but you can find out. It is the same fellows I had trouble with up here a couple of weeks ago over the slugging of a slot machine and I run them away that night and they ran off and left their automobile here. They settled it with Mr. Jones and he finally let them take their machine away. The fellows were often seen around old lady Vinyard's place."

Mr. Jones remembered the two boys who had come to him a couple of weeks earlier and who had admitted that they had slugged a slot machine for seventy-five cents. They had paid Mr. Jones the money and he in return gave them a written message to the person in charge of the filling station so they might get their detained car. At 2:30, Sheriff Dugan went to the Vinyard place, about half a mile up the road. There he found Mrs. Vinyard still up. She showed the sheriff to a room where two boys were asleep with her son, Jimmie. They were Alvin Craig and Walter Hess, about nineteen years old, of Crystal City. The boys, awakened, said that they had left Crystal City late that afternoon to visit Jimmie. They picked up a ride and arrived at the Vinyards' around six o'clock. After playing cards for a time they all went to bed and had been there ever since. Mrs. Vinyard confirmed the statement. The boys readily admitted that they had trouble with Virgil Romine a short time before over slugging a slot machine and that they had fixed it up with Mr. Jones, the owner. Sheriff Dugan arrested the boys on the strength of Romine's statement. Furthermore, the boys had rather bad reputations.

The county officers shortly thereafter received word that Leo Bassler and Dewey Grieshaber had been in the Artesian Restaurant after one

o'clock on the fatal night; they had stopped for some sandwiches and coffee. They related that just before they left the restaurant, three young fellows, roughly clad, and a girl dressed in men's clothing, entered the restaurant, sat down at a table, and ordered food. One of the men was rather heavy, but the other two were very young and weighed only about 130 pounds. *One of these young fellows left the table to play the slot machine.* Just as Bassler and Grieshaber were leaving, he ordered a hamburger. Neither Bassler nor Grieshaber could identify Hess or Craig as among this party, but their descriptions of the two slightly built men fairly well suited the accused boys.

At the trial, which took place on April 18-19, 1929, the defense counsel endeavored to exclude as inadmissible hearsay, the testimony of Sheriff Dugan and Mr. Jones as to what Virgil Romine had said about his assailants. The court, however, admitted this testimony as a dying declaration. The defendants testified in their own behalf but to no avail. The jury found both boys guilty of second-degree murder. Pending appeal, Craig was admitted to bail, but Hess, unable to raise bail, had to go to the penitentiary.

Before the expiration of the year provided for the perfection of the appeal, one Mamie (Babe) Woolem went to the police in St. Louis and volunteered the information that she had accompanied her former sweetheart, Louis Taylor, and two friends, Radford Browning and Joe Muehlman, when the restaurant keeper at the Artesian Filling Station had been shot. She stated that Taylor had done the shooting. The three men were immediately arrested and eventually confessed.

The misfortune of Hess and Craig was due principally to the defective observation of Romine. Although he had probably never before seen Taylor and his gang, he confused them with Craig and Hess, possibly because of a superficial resemblance and the fact that before the fracas Taylor, like Craig and Hess, had been playing the slot machine. Romine said the man who shot him was tall and slim, but Taylor was neither. Even Bassler and Grieshaber, though they could not identify Hess and Craig, did not correctly describe Taylor as the man whom they had heard order the hamburger.<sup>7</sup>

### *Age*

The accuracy of children's testimony has been the object of much investigation, particularly in foreign countries. Some courts place high confidence in the reports of children on the assumption that

they are sincere and have not yet learned the art of deceit. Actually the testimony of children is open to as many sources of error as that of adults and probably a few more. It is known, for instance, that children frequently confuse imagined experiences with reality. There may be no conscious attempt to deception but the child unwittingly accepts unintended subtle suggestions that distort the evidence. In a case where an attempt was made to discover the source of a vicious habit being exercised by some school children, one of the children was questioned by a teacher. The children said, "It is Monsieur—" and then hesitated. The teacher immediately took up and said, "Monsieur who? There are only two people here that they call Monsieur—the Mayor and the priest." Then the child reported it was the priest, whereupon all the children hearing the reply followed the same lead. Actually, a young boy of the village was the guilty purveyor of the habit.<sup>8</sup>

On other quite different occasions children may maintain their independence of thought in the face of persistent opposition. A six-year-old boy was taken for a walk by his grandmother and upon his return reported that he had met his uncle and shaken hands with him. The grandmother vigorously denied the story, saying she had held his hand during the entire stroll and that no one had spoken to him. In the midst of the discussion the uncle appeared on the scene. His first remark was to ask if the boy had delivered his message. It developed that the boy and his uncle had conversed while the grandmother was talking to another lady.

Occasionally a child may concoct a lurid story out of his fancy for the sole purpose of gaining attention, attending court, and being the center of attraction. A number of suggestions have been made to avoid this and other difficulties associated with children's testimony. It has been proposed that all children's testimony be taken out of court by experienced child psychologists agreed upon by the prosecution and defense. These psychologists would be qualified examiners, skilled in detecting factors that would tend to distort the report and competent to gain the child's confidence necessary to elicit a true account. Such a procedure would avoid the tendencies of children in court to act and speak "grown up"; to become inhibited, confused, and involved by the strange atmosphere and contesting counsel.

*Intelligence*

Closely related to the question of age is the effect of intelligence on testimony. The courts have been reluctant to permit the introduction of expert testimony concerning intelligence test scores of witnesses. A Wyoming court in 1927 ruled against such evidence in an assault case, the prosecutrix being a girl of ten and a half years. One of the witnesses gave some testimony as to a mental test, stating that the girl had an I.Q. of 104, indicating that she was slightly above average in mental ability. The court ruled: "This evidence was probably objectionable—It was also unnecessary—. When the jury had seen the prosecutrix on the stand and heard her give all her testimony, they then had so much better way of judging of her intelligence, that we are sure they could not have been influenced by the objectionable evidence about the mental test."<sup>9</sup> In view of the established scientific standing of many intelligence tests, the above ruling appears incongruous. The ruling stands as evidence of the extreme reluctance on the part of the legal system to accept expert testimony in preference to the common-sense impressions of untrained observers.

Quite apart from the admissibility of the evidence is the more fundamental question: Is a highly intelligent individual more accurate in observing than persons less well endowed? In the studies of "classroom crimes" where college students have immediately reported their impressions of what happened, no relationship has been established between intelligence and accuracy of report.<sup>10</sup> Perhaps a fairer statement would be that existing studies fail to show a better-than-average accuracy for the most intelligent observers. However, this finding is in part attributable to the fact that the observers were at the outset relatively homogeneous in intelligence. Probably, if one were to examine a typical cross section of the population, showing a wide range of differences in intelligence, a low positive correlation would be found between accuracy of observation and intelligence. The fact that persons of low intelligence are less competent to express themselves and are more easily led to alter their reports by subtle suggestions, makes them less reliable witnesses. On the other hand, there is no reason to assume that simply because a man shows evidence of intellectual acumen, he is an infallible observer.

## 2. FACTORS BETWEEN OBSERVATION AND RECALL

Ordinarily, there is an interval of varying length between the moment when a crime is committed and when testimony concerning that crime is given. Various factors may operate during that interval to pervert testimony, in addition to those just discussed.

*Memory*

The common legal assumption in regard to memory is revealed by the rule that a witness may be examined as to his memory of events even though they may be unrelated to the events concerned in the litigation. Such a rule assumes that if the witness forgets one kind of events he will also forget another. Memory, according to this assumption, is a kind of entity that men possess in varying degrees. This legal assumption does not agree with a mountain of psychological evidence.

The ridiculous lengths to which this assumption can be pushed is often revealed by the line of questioning. For example:

Q. Did you witness this accident?

A. Yes.

Q. When did it occur?

A. On the 14th of June this year.

Q. That was about five months ago, wasn't it?

A. Yes.

Q. And you say you remember just what occurred as you have testified?

A. Yes.

Q. What time was it?

A. About nine o'clock.

Q. Now, what happened at nine o'clock the next day, June 15th?

A. I don't remember.

Q. And yet you remember what occurred on the 14th of June?

A. Yes.

Q. Is your memory better on the 14th of the month than on the 13th or the 15th?<sup>11</sup>

Memory is not a single process or a unified characteristic of man's behavior. Rather, it refers to the fact that impressions, judgments, or experiences are retained more or less imperfectly over a period of time so that they can be recalled or recognized on some subsequent occasion. The retention and recall of material is dependent on a host of conditions, only a few of which can be mentioned here.

*a. Prejudice.* It has been shown that statements contrary to one's

political preferences are recognized less readily than statements which harmonize with those preferences.<sup>12</sup> The same study showed that a neutral speech on a controversial subject may be interpreted as favorable to the topic of contention by those who are already favorably inclined and unfavorable by those who are not favorably inclined.

A case involving just this point concerned a farewell speech made by the manager of an insurance company's branch office. The man had been discharged with a promise of three months extra pay. The farewell meeting took place at midnight after a day of feverish activity. It was attended by a few representatives of the company and by most of the employees, who were deeply moved by the words of their former chief. In the speech was one word analogous to *rascal* or *scoundrel*; but whether it was used to characterize the trustees of the company or in some other context—this problem divided the listeners. The group favorable to the company believed the word to have been used with offensive meaning. The company accordingly refused to grant the extra remuneration, but the discharged manager contested the action on the ground that his speech was not offensive to the company, an interpretation with which most of the audience agreed. After consultation with a psychologist who analyzed the situation, the presiding judge induced the company to pay the extra compensation.<sup>13</sup> The judge and the psychologist apparently concluded that the false interpretation placed on the speech was in part due to the attitude of a few listeners.

*b. Retroactive Inhibition.* Another factor affecting retention and subsequent recall is the kind of activity engaged in during the interim. Some evidence suggests that imprisonment is more likely to obscure or distort memory of the crime than freedom on bail.<sup>14</sup> Most of the studies on this point suggest that violent activity, calling for complex mental work following immediately on the heels of an experience, is deleterious to its subsequent recall. This process is referred to in the psychological literature as "retroactive inhibition" and may be effective under other circumstances.

Important in many assault cases is the testimony of the victim concerning his assailants. If the victim has suffered considerable shock or was knocked unconscious, it is not likely that he can



recall clearly many of the events just preceding the actual attack or blow causing unconsciousness. A night watchman declared that he had been slugged before the property he was guarding had been entered. Careful questioning elicited from the watchman a wealth of detail about his attackers and their actions right up to the moment when he was struck. The completeness of his testimony aroused suspicions leading to the eventual discovery that the watchman had committed the burglary himself.

*c. Manner of Reproducing Material.* There are two ways recognized by legal procedures in which retained experiences can be reproduced. An individual may *recall* an event, the characteristic features of a person, or the color and design of an automobile. He may also *recognize* a person, a photograph of a scene, or a document. Recognition is easier than recall, as demonstrated not only in laboratory studies but in everyday experience, when, for instance, a name cannot be recalled until someone else utters it and it is immediately recognized as correct. The courts in general have ruled in harmony with this principle, permitting a witness to "refresh" his memory by use of certain kinds of memoranda.

*d. Time.* The most obvious factor affecting memory is the time interval between the original observation and its recollection. A great many writers, in dealing with memory in connection with legal testimony, have appealed to these studies using nonsense syllables that show a precipitous decline in amount retained in the first half hour after learning. Following this initial rapid decline, the speed of forgetting slackens so that one forgets in a week only a fraction more than was forgotten in the first hour following learning. Recent studies making judicious use of meaningful materials such as stories, poems, and textbook selections, have suggested the conclusion that the essential thought of a selection may be retained with high fidelity over extended periods of time, although the unessentials may be forgotten in much the same way as nonsense syllables.<sup>15</sup> It appears that retention of meaningful material does not follow the same course as nonsense materials.

Most of the recollected testimony submitted as evidence in court is, of course, meaningful to the witness. Consequently, it cannot be assumed that memory for such material must necessarily decline as the forgetting curves based on nonsense syllables would suggest.

However, there are good psychological grounds for suspecting the unaided testimony of a witness concerning minute details that are unrelated to each other or to the essential train of events. Such items of experience are ordinarily quickly forgotten.

*e. Eidetic Recollections.* "Eidetic" imagery or recollection refers to the ability possessed by a small proportion of the population to describe in exceptionally precise detail many of their previous experiences. These people are sometimes popularly referred to as having "photographic memories." One professor is reported as being able to give the complete bibliographic reference for nearly every article he had abstracted for his own files. He described his "trick" as merely calling up a visual image of the card in his file and reading off what he had written. Such persons are important exceptions to the principles determining recollection discussed in the previous paragraph, and sometimes unwittingly cast suspicion on themselves by reason of their unusual memory. One case is reported of a murder suspect whose alibi was "too perfect" but who was eventually exonerated after it was shown that he possessed very vivid eidetic imagery.<sup>16</sup>

*f. Memory in Old Age.* It is not at all surprising that old people should deteriorate in their retentive capacities. However, the decline in memory is not such that all kinds of learned or experienced materials suffer equally. It is not uncommon to find old people unable to recall the principal events of yesterday, but very clear in their recollection of occurrences of their youth. Memory in these people is less precise for recent events than for remote happenings. Moreover, common nouns are remembered after proper nouns are forgotten; and verbs are remembered somewhat longer than nouns.

Factors of this sort are sometimes of importance in cases where a will made late in life is contested. Attempts have been made to set aside a will on the ground that the testator was unable to remember faces or names.<sup>17</sup> Such evidence, alone, would not seem to be sufficient grounds to declare the testator generally incompetent to make a will since, as mentioned above, proper nouns are forgotten most easily.

In view of the preceding discussion there is little reason to accept as valid the legal implication that memory is a unitary function

that can be summarily tested by a few simple questions concocted by counsel on the spur of the moment. Accuracy of recollected testimony depends to varying degrees upon each of the features just discussed and many more that continue to escape the dragnet of scientific inquiry.

### *Special Intervening Events*

In the foregoing section was discussed the effect of retroactive inhibition on memory. Occasionally, one finds that unusual conditions intervene between observation and recall that profoundly distort rather than merely inhibit or block memory. Quite by accident an instructor in psychology had an opportunity to measure such distortion when the campus newspaper ran a feature story on the content of the man's lecture. The report of the lecture differed from its actual content in a number of important respects. One or two days after the news story appeared, the class was examined by means of objective tests on the substance of the lecture. Most of those who had read the newspaper article "recognized" it as substantially correct, and on examination remembered what they had erroneously recognized. Those who had not read the news account were more accurate on their examinations.<sup>18</sup>

It is entirely likely that rumors or the testimony of other observers may exert unhappy effects upon a given witness. For this reason there is considerable merit in the practice of separating witnesses, not simply to prevent outright collusion but to reduce the unintentional errors.

The number of times that a person is called upon to repeat his testimony may affect his feelings of certainty concerning it. An acquaintance of the author at one time devised a very exciting fictitious tale about his own experiences falling overboard from a large trans-Atlantic steamer. The story was first told to the man's daughter as if it were true, to provide material for an English composition. Gradually it filtered back to the homes of neighbors, who inquired for more details. The hero of the fictitious story continued the pretense in the spirit of fun for some months, retelling the story on numerous occasions until he realized that he believed it himself. The impression of certainty often given by some witnesses may not be the result of clear and unmistakable observation but

may rather reflect the frequency with which the witness has repeated his story.

### 3. COURT CONDITIONS

It is not by accident that courthouses are frequently massive, imposing structures and courtrooms are heavy with formal ritual. It is partly by these means that the majesty of justice is impressed upon those who assemble before the law. In a smoke-filled room with scarred benches and an easy-going informality the facts of a case might be elicited. However, the seriousness of the proceedings and the desirability of truth are conveyed to the witnesses, jury, and counsel by the atmosphere of a court trial.

#### *Oath*

Probably the principal feature of a court trial designed to increase the veracity of testimony is the administration of the oath. The law has assumed with some factual basis that a person under oath is a more reliable witness than one not under oath. Indeed, one writer has suggested that courts revert to the earlier practice of compelling each witness to kiss the Bible, declaring, "that since kissing the Bible was dispensed with perjury has increased.—The soul is defiled in order that the body be kept free from alleged disease germs; thus we satisfy doctors and sanitary experts at the expense of justice."<sup>19</sup> While the attitude expressed in this quotation is probably not representative of the legal profession, it does portray in somewhat extreme form the belief that an oath places a man under the control of special religious strictures conducive to truth-telling.

It is somewhat difficult to appraise the effect on testimony of an oath ordinarily administered, simply because the courtroom cannot be turned into an experimental situation. Laboratory studies in which subjects are permitted to inspect a photograph for a short time, or reports of unexpected classroom "crimes," have shown that the oath tends to reduce the number of items reported but increases the accuracy of the report. In one laboratory study, subjects normally gave testimony that was 20 to 25 per cent incorrect, but when the same "witnesses" were placed under oath the incorrect testimony dropped to only 10 per cent.<sup>20</sup> A number of other similar studies are in general agreement with these findings.

Accordingly, one may safely assume that the oath is conducive to truth-telling when the individual himself has little at stake. It seems to make the witness more conservative and careful in replying. On the other hand, it seems reasonable, in the absence of any controlled data on the point, that the oath will have little effect when the witness has an important interest in jeopardy. Under such circumstances, self-interest will probably take precedence over religious or moral strictures.

### *Narration vs. Questioning*

Probably the most natural way of getting information is to ask a witness to tell what he saw or heard. Opposed to this procedure is the question approach favored by a great many courtroom lawyers, in which the witness is asked a specific question concerning one or two discrete observations. A number of lines of evidence point to the conclusion that the narrative method is superior from the standpoint of accuracy. It is, however, open to two objections: (a) the witness generally gives a limited range of data; or (b) the witness may present irrelevant or inadmissible hearsay evidence. The question method is often time-consuming and productive of much futile quibbling. Probably the ideal procedure is to allow a witness to tell his story in his own way, and then to supplement the testimony with questions covering points omitted in the narrative.

### *Question Form*

"When did you stop beating your wife?" is the prototype of leading questions. It contains a hidden assumption, not previously admitted, that one has been beating his wife. Unless the person being questioned is resistant to the suggestion embodied in subtle questions of the kind, he is likely to be led to give quite erroneous testimony. "Was the man's hat brown or grey?" forces the witness to think in terms of color, while the more fundamental issue as to whether the man was wearing a hat or not is pushed aside. Regardless of whether the witness answers grey or brown, he has tacitly admitted the man was wearing a hat. Leading questions of this kind are usually not permitted in direct examination, although the court exercises considerable discretion in this regard. Ordinarily

leading questions are more frequently permitted in cross-examination on the assumption that if the witness is positive of his testimony he will readily detect the hidden assumptions and will not be drawn into the trap. The deliberate use of leading questions by counsel, therefore, has some merit under special conditions. It is, however, possible that a highly suggestible witness of low intelligence may become confused by such questions even when possessing accurate and positive testimony.

Aside from leading questions with hidden assumptions, other forms of questions have been subjected to investigation in an effort to discover the extent to which they may distort testimony. Questions such as, "Didn't you see a yellow car?" or "Wasn't there an ash tray on the table?" seem to expect a "yes" response and are more likely to give erroneous information than "Did you see a yellow car?" or "Was there an ash tray on the table?" The presence of the initial negative in the question seems to be the distorting factor.<sup>21</sup>

Moreover, questions that fail to emphasize what the witness has himself observed are likely to give less reliable answers than questions framed to stress the witness's experience. For example, "Did you hear the bell ring?" is more likely to give reliable information than "Did the bell ring?" In the first case the question forces the witness to consider his own experiences, whereas the second calls for a more detached recollection. A witness might have erroneously inferred the bell had rung from something he had seen, but the second of these questions would not ordinarily uncover the fact. However, if the witness is forced by the form of the question to consider whether *he heard* the bell, he is less likely to confuse inference with actual experience, although inferences may be made regardless of the question form, as the discussion of observation has already pointed out.

By way of summary, it is apparent that questions which start with a negative verb, which fail to stress the witness's experience or contain hidden assumptions, are productive of erroneous testimony.

#### 4. THE JURY

In the early days of its history the jury went out to find the truth for itself. The jurors were usually neighbors of the parties involved

in litigation. They were frequently chosen because of their special knowledge of the factors in the case at issue. In consequence, the witness-jurors knew by firsthand information how a person had acquired his property or the nature of his relations with other members of the community. The jury system, under such circumstances, worked rather well and avoided many of the injustices of the preceding systems.

With the expansion of population, the development of rapid means of travel, and a host of other factors, the methods of crime have changed. Methods of dispensing justice, however, have not kept pace.

The jury's function today is to determine the facts of a contentious case. Out of the welter of assertion and contradiction the jury must come to some decision in regard to the truth in the contested issues. It remains for the judge in most jurisdictions to apply the law to the conclusions reached by the jury and to see that the court proceedings are in the proper legal order. In theory, at least, the jury ponders the evidence submitted by both parties, sifts the good from the bad, and concludes that the defendant is either guilty or innocent of the charges against him.

Trial by jury, once a highly prized democratic institution, has suffered much criticism in recent years. Some of the more blatant reformers have called for the abolition of the jury trial as a menace to justice. Quietly, without paying much heed to these reformers, the jury trial has been gradually disappearing from the American scene, notwithstanding the contrary impression maintained by fiction writers and motion-picture producers. As early as 1924, only 180 out of 4499 criminal cases in Baltimore were tried before a jury. In the entire state of Maryland in 1925, 93 per cent of such cases were tried without a jury. For the same year the percentage of felony prosecutions reaching a jury in New York City was 4.7; in Chicago, 3.8; in Cincinnati, 11.8.<sup>22</sup> More recently, combined reports from the states of California, Illinois, Massachusetts, Michigan, New Jersey, Ohio, and Wisconsin show 47.3 per cent of all cases in Common Pleas courts were tried by jury. However, the states differed widely among themselves in the practice, Massachusetts trying 81.8 per cent before juries while for Indiana the percentage was only 26.5.<sup>23</sup> The prized institution of an early

stage in the struggle for political freedom is a less popular custom of today.

What is the trouble with the jury system? Are the faults real or illusory? What has contributed to its growing unpopularity?

The basic difficulty with the jury system is not its organizational inefficiency but rather the incompetency of the average jury to execute its function. To say that the jury's function is to decide the facts at issue is to gloss over an exceedingly difficult task calling for a wide variety of skills and knowledge. Any given jury may be called upon to decide a damage suit against a large corporation, a charge of criminal negligence, a burglary case, or a homicide. They must listen to, and evaluate, the testimony of highly technical experts, ordinary laymen, police officials, and sometimes children. The jurors, often without previous court experience, must understand the heavy, redundant, legal language of attorneys skilled in the niceties of the law.

One writer, after some thirty years observation of courts and juries, wrote of the perfect juror as follows:

He should be an experienced business man, a trained psychologist, an accountant, a personnel expert, a man of good common sense, an educated man with a thorough knowledge of language and logic; he should know something of the poor and unfortunate and those easily led astray. He should have sympathy controlled by good judgment and should be without prejudice against rich or against the poor, and, in short, should be a philosopher able to temper justice with mercy, but who can punish as well as forgive, and not forget the past victims of crime nor the future victims who may suffer or die because of unwise sympathy for the criminal before him. Finally the juror should have a reliable knowledge of this vague and indefinite something we call human nature.<sup>24</sup>

Men and women of this stripe are few if not actually nonexistent. But even if they did exist in large numbers the method of selecting juries now in force would probably eliminate them from jury service. Professional and business people with responsible positions are readily excused; lawyers as a profession are automatically exempt. These are the people best qualified to weigh objectively the conflicting arguments of the courtroom. The very existence of the so-called blue-ribbon juries drawn for special



investigations reveals that justice is ordinarily dispensed by second-raters.

In addition to the usual exemptions each counsel has the right to reject a certain number of prospective jurors because of manifest prejudice in the case to be tried or for other pertinent reasons. It is to the obvious advantage of at least one of the lawyers to have gullible, slow-witted jurors who will not see through the flimsy evidence or arguments of his case.

In summary, it becomes apparent that the present method of selecting jurors is not wholeheartedly aimed at picking the most capable persons from the general population, even though the juror's responsibilities are such as to require the best citizens available.

### *Prejudices Affecting Judgment of the Jury*

Human beings like to pride themselves on being rational; on being capable of reason. Actually, men are rarely logical in their thinking. They jump at conclusions from false premises or use fallacious devices to force their conclusions to agree with their prejudices. Sometimes their most valued prejudices are dignified and protected by calling them "principles." But regardless of the labels attached to "unreasoned" beliefs it is important to observe how these biases subtly influence thinking. The problem is of peculiar significance in considering the jury since error in verdicts is often the outcome of either prejudice or ignorance.

A juror's socioeconomic status is an important determiner of his attitude toward conflicts of the labor vs. management type. A suit against a large corporation for alleged damages to a middle-class workman, if tried before the ordinary jury of middle-class people, is an uphill fight for the corporation from the beginning. The jury's sympathy is very likely with the contestant most like themselves. In addition, Americans in general seem to favor the underdog in every contest. On the other hand, those from the managerial occupations may be similarly inclined to favor litigants of their own status.

Occasionally a juror may, in the privacy of the jury room, openly express his convictions in very dogmatic fashion. For example, "I have no use for corporations and their lawyers"; or "I'm going

to get back at ——— Company for the way they treated the pickets last year." Ordinarily the unexpressed prejudices of jurors are more insidious since the juror himself is often unaware of the real reasons for his verdict vote when the case is difficult to decide.

In some portions of this country, deep-seated race prejudice exists that has been an important feature in some trials, such as the much publicized Scottsboro case of some years ago. Less widespread than the prejudice against Negroes is a similar feeling about other nationalities, such as the southern European and the Asiatics. Some cases beyond question have been decided not by the evidence presented in court but rather by the jury's dominant racial prejudice in favor of, or against, one of the litigants.

It is interesting to observe that one of the alleged reasons for the superior efficiency of the English juries lies in the fact that, for the most part, Englishmen sit in judgment of other Englishmen. Presumably race prejudice is reduced to a minimum in such a situation and cases are more likely to be decided on the evidence presented. Precisely to what extent this factor is important in the English system is, of course, a matter of conjecture at the moment.

One's belief in the innocence or guilt of a defendant is in part determined by what the older psychologists referred to as the "will to believe." In this connection a very illuminating study revealed the relationship between three factors: the desire that a given proposition be true; belief that the proposition is true; and the evidence supporting the proposition. A number of statements were prepared such as: Was Lincoln an honest and upright man? Do molecules exist? Do only the good die young? Is democracy the best form of government? Is the protective tariff a wise policy for the United States? Subjects rated these and similar statements on a scale indicating the degree to which the statements were believed. Next, each statement was rated on a scale of desire; that is, the extent that the subjects wished the propositions were true. Finally, a rating of the amount of objective evidence supporting each of the statements was obtained.

The data indicate that people tend to believe propositions more because of a desire that the proposition be true than because of the amount of evidence supporting it.<sup>25</sup> If this is true of simple

statements unaccompanied by the drama of the courtroom, it is quite possible that questionable propositions paraded before the jury in their most favorable light are accepted more because the jury would like to believe them than because of the factual evidence marshaled in their behalf.

The range of human prejudice is almost limitless, but one or two additional sources demand attention. A host of minor personality features of witnesses often play a part in persuading a jury. Some jurors will distrust brunettes, others with equal certainty will have no confidence in the statements of a blonde. A person whose personal appearance fits the conventional concept of a movie villain—pointed features, sly expression, a slight stoop to the shoulders, a smooth patter, and flashy clothes—such a person's testimony is likely to be heavily discounted. The witness with an air of quiet assurance is likely to carry more weight with the jury than one who has an uneasy manner and a quavering voice. The jury rarely considers that an air of assurance may come from frequent appearances in court while the hesitant, uneasy manner of the other witness may merely be the reaction to unfamiliar proceedings. The conventional and often fallacious indicators of character frequently lead jurors to evaluate incorrectly the testimony of many witnesses.

### *Inattention of the Jury*

College professors and students alike are not unfamiliar with the problem of concentrating attention on minute details. Much the same kind of problem is present in the jury box. It is related that a defendant convicted of murder appealed on the ground that one of the jurors was asleep during a portion of the judge's charge. The juror when later questioned said he was not asleep but only had his eyes closed because of the bright lights.<sup>26</sup> There are no doubt a great many other instances in which jurors have had their eyes open, but their thoughts were concerned with things irrelevant to the trial.

This state of affairs is not entirely due to inferior ability on the part of the jurors. The punctiliousness of legal language filled with redundant verbosity is a tax on the attention of even trained lawyers, many of whom in turn use the same heavy language with

the mistaken notion that they are impressing rather than boring the jury. There are, of course, intensely dramatic trials in which attention of the jury does not lag perceptibly. On the other hand, it is doubtful whether human beings can maintain a high degree of sustained attention over periods as long as the usual court session, even though outward behavior gives no hint of a mental nap.

There is no ready solution to these difficulties without eliminating the jury itself. It is a matter of human limitations. The ordinary person can rarely concentrate on all of the details of a given crime as they are presented from the witness stand over an extended period of time. The seriousness of the problem can be alleviated somewhat by simplifying court procedure and legal language.

### *Changes in Jury Opinion*

How do the opinions of jurors change in the course of a trial as the conflicting evidence is unfolded before them? Are initial impressions lasting? Does the order in which evidence is presented have any influence on its effectiveness? Studies having a direct bearing on these questions are few, but tentative answers can be given on the basis of two very ingenious investigations.

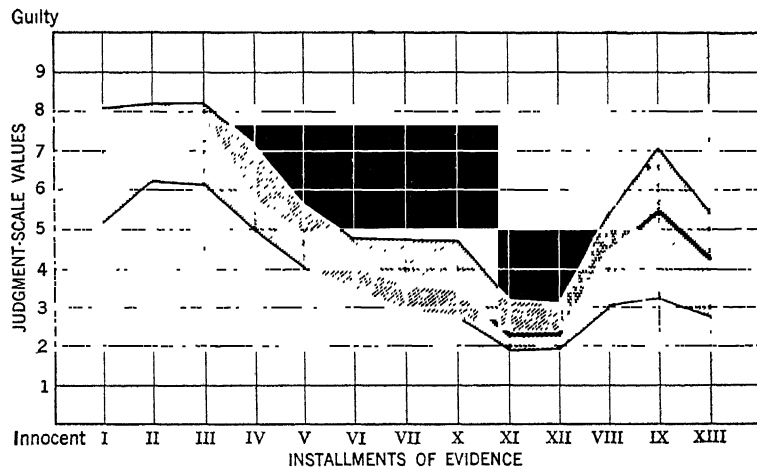


Figure 39. Showing Relation Between Judgments of Guilt or Innocence and Installments of Testimony. The Central Line Represents the Median Value of all Judgments for Each Installment. The Width of the Shaded Area Represents the Quartile Deviation Above and Below the Median. Stippled Area Represents Evidence for Prosecution; Barred Area Represents Effect of Evidence for Defense.

In the first study, a detailed report of a criminal case was divided into thirteen sections and read to groups of students who were to consider themselves jurors.<sup>27</sup> The sections were so defined that each contained only evidence for the prosecution or the defense. At the end of each section of the report the "jurors" were asked to indicate on a nine-point scale the degree to which they were certain of

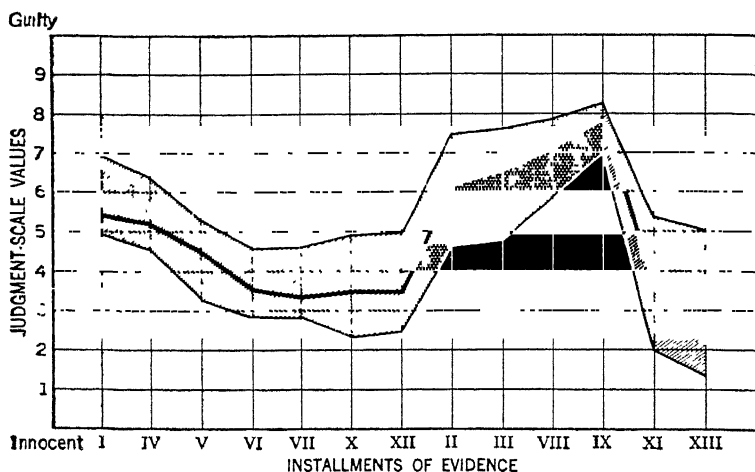


Figure 40. Showing Shifts in Judgments with Altered Order of Presentation.

the defendant's guilt. Fluctuations in the jurors' opinions are shown in Fig. 39. Inspection of the figure shows generally that the prosecution's evidence tends to shift the median opinion toward the guilt end of the scale, while the evidence for the defense has the opposite effect.

The more important findings of this study developed when additional "jurors" were presented with the same evidence but in a different order. In the presentation as diagrammed in Fig. 39 the final median opinion was 4.4. This numerical rating means the jury was generally doubtful of the defendant's guilt. The new order of presentation and the resulting effect on opinion at the end of each section is shown in Fig. 40. In this presentation the final median judgment is 2.2 or a fair belief in innocence.

A close comparison of Figs. 39 and 40 show other striking differences. Notice that section II of the report when first presented failed to alter materially the jury opinion. In the second presenta-

tion, the same evidence caused a change in opinion of nearly three points. Similarly, section XI was only moderately effective in altering opinion in the first presentation, but accounted for a marked change of more than four points in the second. In other words, it is very apparent that the persuasiveness of evidence depends in part on its context. There is a "psychological moment" when a given argument or asserted fact will carry much weight with the jury. Presented at other moments in the trial, its effect may be dissipated.

The conclusion from this study is in agreement with a longstanding suspicion that the order of presenting evidence was important, but never before has the belief received such convincing proof.

A second investigation was more realistic in that the evidence was presented in a moot court of the kind employed to give law students practice in court procedure. Counsel for plaintiff and defendant were law students, while the judge was a law professor. The witnesses were selected and coached in their parts by the "attorneys." The points at issue and all the evidence were taken from an actual case. Three juries heard the evidence and each member of the juries made independent ratings of the defendant's guilt at eighteen points in the course of the trial. The rating system was identical to that used in the study just discussed.

Since one of the objects of this study was to determine the influence of women jurors, the juries were selected so that one was composed entirely of men, one was entirely female, and the third was mixed. At the conclusion of the judge's charge to the juries, they retired to separate rooms, cast their votes, discussed the case, and revoted until three ballots were taken.

No significant differences in the jury opinions could be attributed to the sex factor. It was found that all but one of the jurors stuck to their first votes throughout all of the discussion of the case in the jury rooms. A study of the shift in opinion as the trial progressed showed that the important determiners are the opening and closing statements of the attorneys for each side.<sup>28</sup>

These findings are in harmony with what we have previously said about the effectiveness of evidence and much of the highly restricted and technical procedure composing the bulk of a jury trial. Much of the action is wasted motion so far as influencing jury opinion is concerned.

No doubt part of the reason for the jurors in the above study failing to change their votes after the first ballot was due to the prevalent human belief in one's own infallibility. Once a decision is made, some believe it is a mark of weakness to change it. Doing so sometimes implies that the original decision was not well considered. Furthermore, it is interesting to observe that the above study does not support the common generalization that women are more stubborn and less swayed by reason than men.

## 5. SUMMARY AND CONCLUSION

This rapid survey of the psychological aspects of trials and courtroom procedures has stressed the science rather than the art of psychology. It has dealt with the known sensory factors that distort initial impressions of events; the conditions of memory and observation that contribute to further inaccuracies in testimony. Attention has also been directed to court conditions, such as the oath and the manner of questioning, as well as the problems surrounding the efficiency of jury trials. This material is the science of the courtroom.

To some it may prove disillusioning not to find suggestions and techniques that will enable the young attorney to play a subtle game of "psychology" in the court. No master keys to the secrets of man's nature are given. Instead, discrete facts are presented which may be looked upon as the numbers of a combination which, if arranged in their proper order, may open the door to a new insight into a particularly baffling instance of contradictory testimony, or unexplained jury action. Finding that combination with the facts before one is the art of psychology. Legal cases are rarely the same; the combination, therefore, cannot be the same. The science of legal psychology can be sketched as has been done in this chapter, but the art is acquired largely through experience.

## Chapter 16

### DETECTING DECEPTION

Is the witness telling the truth? This question is a recurring theme in nearly every courtroom scene. It injects itself into every examination by the police prior to the arraignment of suspected criminals. Though rarely answered directly, it is perhaps the key question affecting the course of justice.

The search for reliable indexes of deception has a long past. Ancient rituals were performed, talismans consulted, ordeals and tortures were inflicted in the belief that magical results would reveal the truth-teller and the liar. These practices ran the gamut from those with some validity to others totally devoid of any foundation in present-day scientific findings. As an example of the former, in the court of Alexander the Great a physician is reputed to have "solved" an incestuous love affair by observing the "tumultuous rhythms of the pulse" when one of the accused was questioned. At the other extreme was perhaps the original scales of justice consisting of a large balance beam suspending a pan at each end. The accused was placed in one of these and an equal weight in the other. After the adjustments were made an exhortation was delivered to the balance. If the accused weighed lighter after the exhortation he was acquitted, but if he was heavier he was judged to be guilty.

The rack, lash, and boot (a vise arrangement that slowly crushed the foot) were among the least ingenious instruments of torture used during the Middle Ages in an effort to break the "will to deceive" and extract confessions. Some of these devices have survived in modified form today under the head of the much publicized "third-degree" methods of some police departments. Even though these brutalizing methods are outlawed (as was also the case in England under the Magna Charta) they continue to be used



with unofficial sanction by unimaginative police and detectives anxious to gain recognition for the cases they solve. It is hardly necessary to point out that innocent persons are likely to confess to avoid further punishment and then repudiate their confessions in court.

The psychologist has attacked the problem of deception from an entirely different angle. The basic assumption underlying the use of methods described in this chapter is that the individual under examination will be more emotionally disturbed when he lies than when telling the truth. In other words, the so-called lie-detectors detect not lies but physiological changes that accompany emotions. These alterations in bodily functions may, and do appear when emotions other than those associated with lying are stimulated. Just as the physician must be trained to integrate, discount, and interpret the various symptoms presented by a given patient before he can arrive at a diagnosis, so the records from a deception test must be interpreted by a skillful operator. The skill of the operator in framing questions and in searching for key points that will produce the lying reaction uncomplicated by other responses is perhaps as important as the apparatus employed. It is, however, beyond the scope of this chapter to do more than describe the indexes of deception and their relative value. Skill in their use can be acquired only through practice, after appropriate background training in psychology and physiology.

### 1. ELECTRODERMAL RESPONSE

It has been known for a long time that if a slight electrical current is impressed on the skin, variations in the flow of that current can be observed with appropriate electrical meters. These changes in the flow of current are to a very large extent due to changes in resistance offered by the skin through the reflex action of the sweat glands. When the glands secrete at a faster than normal rate it is possible that some of the observed changes may also be the result of electrical currents generated by the action of muscle or nerve tissue when the subject becomes tense and later relaxes. Regardless of the possible reasons for the observed changes in the flow of current, the electrodermal response (sometimes called "galvanic skin response" or "psychogalvanic reflex") has been observed to

occur whenever the subject reports fear, embarrassment, expectancy, anger, surprise, or allied conditions. Indeed, the skin resistance is lowered in response to almost any unfamiliar or unusual stimuli.

Because of its extreme delicacy as an indicator of emotional and other responses, it has been both condemned and recommended by investigators in the field. Those who find it useful insist that it reveals deception responses that other indexes fail to register. On the other hand, its opponents point to the high degree of control which the operator must exercise over the examining situation to ensure that no extraneous factors (noises from outside the room, long periods of adjustment between questions that may be disturbed by interruptions, inability to prevent the subject from obscuring lying responses by deliberately thinking of exciting events between innocuous questions) will complicate the records. The extreme delicacy of the response is both its forte and its fault.

A recent report of a laboratory investigation reveals a method of employing the electrodermal response that circumvents some of these objections. Gelderick had his subjects lie about the playing card they drew from a small packet. Each card of the packet was called out by the experimenter and the subject denied each in turn, thus telling the truth in every response but one. Originally each verbal response was accompanied by some change in resistance. However, the electrodermal response was "fatigued" by calling a long list of cards, none of which was in the packet until the subject failed to show a change in resistance. Then the cards in the packet were called and in 100 per cent of the fifty cases a significant change in resistance occurred on the critical card.<sup>1</sup> Some of the field investigators dealing with criminals feel that the electrodermal response is quite valid in mild laboratory situations of this kind, but it is hazardous to generalize from these data and conclude that the criminals would be detected with equal certainty.<sup>2</sup>

## 2. BLOOD PRESSURE

Although as previously noted, the relation between deception and circulatory changes has been observed for several centuries, it was not until 1917 that Marston reported a study in which he observed increases in systolic pressure while the subjects were

questioned about a fictitious crime.<sup>3</sup> The experiment was arranged so that part of the subjects lied and part told the truth without the experimenter knowing which they were doing. Marston used in this pioneer experiment the discontinuous method of recording by taking measures of the pressure as the physician ordinarily does with an inflated arm band and stethoscope. His measures were taken at various points during the examination. Later refinements in apparatus have made it possible to record the heart action continuously, thus catching all the minor variations in pressure which a discontinuous method would lose. Even with this somewhat crude method of recording blood-pressure changes Marston reported correct diagnoses of deceit in 98 per cent of more than one hundred examinations. Subsequent investigators using laboratory crimes have not achieved so high a percentage of correct diagnoses as Marston reported, although the lowest is approximately 70 per cent.<sup>4</sup>

### 3. BREATHING RECORDS

Benussi, an Italian, reported in 1914 a series of studies using breathing records as indexes of deception. According to his findings, the ratio of the time for inspiration to the time for expiration provided an infallible symptom. Following a falsehood, Benussi claimed the I/E ratio increased over what it had been for the cycles of breathing just preceding the question.<sup>5</sup> Burr in this country repeated with some variations the work of Benussi, but failed to verify the sweeping claims of the latter. The best series of experiments showed the I/E ratio to be a valid indicator in only 73 per cent of the cases.<sup>6</sup>

In spite of this rather poor showing, breathing records are often employed along with other devices in field examinations. Some of the criminal investigators report that a deep breath or a very irregular breathing pattern after a suspected falsehood, rather than the I/E ratio, is a dependable symptom of lying. No statistical studies on the comparative value of these symptoms has yet appeared.

### 4. LURIA TECHNIQUE

The Luria technique is a recent modification of the older free-association tests originally developed for psychiatric work. The

free-association test requires the individual to respond with the first word that comes to mind after the experimenter utters a stimulus word. This procedure has been tried out as a deception indicator on the assumption that the person trying to cover up his connection with a crime will hesitate to give the first association that comes to mind when words pertaining to the crime are suddenly injected into an otherwise innocuous list. For the most part the free-association test has proved to be a convenient classroom demonstration that works more often than not, but has not found favor in criminal investigation.

Luria, a Russian psychologist, built upon this basic procedure asking his subjects to respond manually by flexing the fingers of one hand at the same instant they responded verbally. Attached to the fingers was a bellows that, when compressed, activated a recording pen resting on a moving tape. In this way the action of the fingers could be registered. Other recording devices indicated on the same tape exactly when the stimulus words and the verbal responses were given. In many instances deception was revealed by a slight movement of the fingers just prior to the verbal and usual manual responses. In other cases a tremor appeared, or a very noticeable change in the form of the finger response in which there was a gradual rather than a sudden flexion.<sup>7</sup> Luria presented no statistical evidence indicating how often these unusual finger responses were associated with deception, although he did present findings from both laboratory and criminal investigations.

A number of investigators in this country have generally verified the essential findings of Luria in laboratory studies and the Chicago police are now in the process of experimenting with it in criminal cases. The laboratory studies have indicated that the Luria technique may be expected to give positive diagnoses of guilt or innocence in 68 to 75 per cent of the cases.

## 5. EYE MOVEMENTS

It has long been suspected that deceitful persons have shifty eyes. This hypothesis was put to a test by photographing a spot of light reflected from the cornea of the eye in forty subjects, half of whom were guilty of a "laboratory crime" and half innocent. The subjects were required to look straight ahead and hold their eyes

as steady as possible throughout a standard series of questions some of which pertained to the crime and some of which were "controls" or unrelated to the crime. No significant differences appeared to distinguish falsehoods and truthful responses during the question period. However, after a short rest, the subjects again held their eyes steady during which time no questions were asked. This so-called silent period proved diagnostic, since the guilty subjects improved in the steadiness of their gaze while the innocent in most cases became less steady as the period progressed. In view of the fact that the changes in steadiness of fixation were very slight, the records were judged independently by six persons whose accuracy in picking the innocent and guilty subjects varied from 64 to 77 per cent. The consensus of the judges, however, gave an accuracy of 80 per cent.<sup>8</sup> Subsequent studies with a few criminal cases show sometimes a very noticeable increase in eye tremor after falsehoods. It is entirely possible that in situations where more is at stake than in the laboratory crimes the increased tremor after critical questions will prove significant.

## 6. BRAIN WAVES

About twenty years ago it was discovered that minute electrical currents were generated in the brain, particularly in the occipital area. When these currents were amplified and sent through an oscilloscope they showed two outstanding characteristics. First, there was a relatively slow, rhythmical current named the "alpha" wave, and second, superimposed on this alpha wave was a much faster oscillating current which came to be named the "beta" wave. It soon was evident that the alpha waves tended to disappear in states of excitement. Using this criterion of deception, Oberman<sup>9</sup> asked five judges to rate brain-wave records collected from thirty-three subjects, each of whom had drawn a card from a packet of five and later when questioned had lied about the card drawn. The best judge was able to identify correctly the lie reaction in 50 per cent of the records. Others were correct between 48 and 39 per cent of the time. Since the judges might have correctly selected the deception response in 20 per cent of the records by chance alone (five records per subject gave the judges one chance in five of being right), it follows that the best judge was 150 per

cent better than chance. In other experiments guilt responses were correctly identified by the average judge 48 per cent of the time or 140 per cent better than chance. On the surface, these figures look impressive, but it will be noted that the judges were more frequently wrong than right in their selection of the deception response. Until brain waves have been subjected to a test more comparable to the practical situations met in criminal investigations they do not merit recommendation for this purpose.

## 7. COMBINED METHODS

In practice most investigators rely upon more than one of these indicators, although sometimes the galvanometer is used without supplementary apparatus. Probably the most widely used instrument is the Keeler Polygraph which includes a blood pressure and pulse tracing, a record of the galvanometer changes, and a breathing record.\* The accuracy of this device in the hands of a competent examiner is shown by the fact that out of 2171 cases examined at the Northwestern University Crime Detection Laboratory between January, 1935 and June, 1938 only twelve mistakes were made in diagnosis as shown by later evidence. The Wichita police built up a similar experience in which 24 per cent of the four thousand cases examined over a three-year period indicated guilt. Of these, 55 per cent confessed, 30 per cent were not prosecuted by the complainants, 12 per cent were convicted by court action, and 3 per cent were acquitted, some on technical grounds.

It is quite evident that the combined methods of investigation are superior to any single one individually. The situation is somewhat analogous to that presented to a physician when called upon to diagnose a patient's complaints. The more symptoms he can find, the more accurate can be the diagnosis. A rapid heart may indicate a number of diseases, but data on the patient's temperature, blood count, and other symptoms reduce the error of diagnosis. Likewise the greater the number of deception symptoms, the more accurate should be the diagnosis of deception.

\*Police departments using essentially this combination are: Berkeley, Calif.; Chicago, Elgin, Evanston, and Wheaton, Ill.; Indianapolis, Ind.; Honolulu; Wichita, Kans.; Kansas City and St. Louis, Mo.; Buffalo, N. Y.; Cincinnati, East Cleveland, and Toledo, O.; San Antonio, Tex. It is also used by the U. S. Department of Justice, and the state police or other state agencies in Illinois, Indiana, Michigan, North Dakota, Pennsylvania, Rhode Island, and West Va.

## 8. LEGAL STATUS

The legal status of deception tests has yet to be decided in a great many states. In New York, for example, the Queens County Court accepted the testimony of an expert based upon tests made with a galvanometer. Not long afterwards, the Kings County Court of the same state refused to admit similar evidence from the same expert. However, there have been several cases, particularly in the Middle Western states, where the testimony of examiners has been admitted in evidence. Leonarde Keeler, after a special agreement between the defendants and the state in a murder trial, made an examination of the defendants which, by the terms of the agreement, was admitted in evidence.<sup>10</sup> So far, no superior court has ruled on the admissibility of polygraph records, which reflects two conditions: first, only a few courts have considered the question, and second, in those cases where expert testimony based on the records or the records themselves have been admitted, the contending counsel have previously agreed not to raise objections. The courts with considerable justification have taken the attitude that deception tests are not yet infallible. Some years ago Wigmore laid down the principle that, "If there is ever derived a psychological test for the valuation of witnesses, the law will run to meet it. Both law and practice permit the calling of any expert scientist whose method is acknowledged in his science to be sound and trustworthy. Whenever the psychologist is really ready for the courts, the courts are ready for him."<sup>11</sup>

## 9. PRESENT APPLICATION OF METHODS

If the courts are reluctant to admit in evidence the polygraph records or testimony based upon them, the question naturally suggests itself, Where can the methods be used; what value are they? In broad outline, the techniques have proved helpful to police in their preliminary investigations of crimes and more recently in a wide variety of commercial situations where pilfering of merchandise or money is suspected among employees of retail stores, filling stations, hotels, and banks.

*Criminal Investigation*

So far as the police are concerned, polygraph records provide

evidence of such a nature that deceiving suspects often admit their guilt when confronted with the clear picture of their unusual physiological changes to critical questions. In general, approximately 50 per cent of those diagnosed by police examiners as being guilty of the offenses in question confess their guilt shortly after the examination. For the year 1940 the Scientific Crime Detection Laboratory of the Chicago police diagnosed 131 cases as guilty. Of these 61, or 47 per cent, made admissions of guilt before leaving the laboratory. Of 127 cases reported innocent by the examiners, 5, or approximately 4 per cent, were found guilty by their own eventual admissions or other significant clues. Among those that confessed at the laboratory following the tests, one confessed to five offenses, one to six, one to two, and one to about seventy offenses (burglaries).<sup>12</sup>

Furthermore, the police sometimes gain new leads or encouragement to investigate a given suspect further. In one case illustrating this point, a housebreaker confessed to a series of petty thefts but steadfastly denied the theft of an expensive ring which had been "lifted" by the same *modus operandi* employed in the burglaries which he admitted. A complicating factor was the inability of the police to find the ring among the loot which the accused had pawned in local shops. A test was given to determine whether he had participated in the ring burglary. The results indicated his guilt. The police then redoubled their efforts, widened their investigation, eventually discovered the ring in a near-by city, and uncovered the fact that the same man had pawned other items which were traced to burglaries in three other communities. The positive identification of the accused by the pawnbrokers was perhaps the most outstanding evidence presented in court. However, previous to the deception test, the police were about ready to abandon further investigation of the ring. The burglar, on his part, was apparently willing to take a light sentence for the petty thefts hoping that once he was "out of circulation" his connection with the ring and the other crimes would not be discovered. Without the polygraph the burglar might have succeeded in his plan.

In still other cases the polygraph serves as a screening test eliminating those who may be suspected but who are actually innocent, thus narrowing the focus of attention to two or three persons who



may be investigated thoroughly. It has been estimated that the state of Michigan saved \$25,000 in trial cost alone by the use of the polygraph in 1938. During that year Lieutenant Harold Mulbar of the state police examined 253 persons of whom 129 were cleared. A complete investigation of these 129 innocent persons would have added considerably to the police costs of that state.<sup>13</sup>

In the commercial field the polygraph has been put to numerous uses. Most dramatic have been the regular examinations of bank and retail-store employees for bonding companies. One such company employs examiners who make tests of all the employees of a given organization. Those who show by their records that they have been guilty of pilfering are given a warning after the first test. Six months later the examiners return and test a random sample of the employees. Those who continue to show unexplained irregularities in their records are dealt with severely. The bonding company has discovered that this system works so well in reducing their losses that organizations using the system are offered substantially reduced bonding premiums. When the employees of one chain of drugstores were examined, the records followed by confessions showed 76 per cent were taking merchandise or money. Six months later only 3 per cent were continuing their pilfering. In department stores and hotels unaccountable inventory shrinkages have been reduced considerably by the regular use of deception tests. The service charges in one chain of filling stations took a \$500 per month increase after deception tests had revealed some employees were pocketing these charges.

Deception tests have often revealed widespread dishonesty among those who are ordinarily held above suspicion. Sixty-two per cent of all tellers tested in a representative group of Chicago banks admitted after their tests that they had taken "a dollar or more" in the year preceding. One survey including all kinds of bank employees showed that 15 per cent of the 2500 persons examined were taking some money. Among those handling merchandise 91 per cent or more run polygraph records indicating some thieving, although not all of these will admit their guilt. Significantly, retests of the same employees six months or a year later give all but 1 or 2 per cent of them a clear bill.

Deception tests, then, have considerable value as a deterrent

among those who are constantly placed in positions where they can frequently appropriate for themselves relatively small sums of money or articles of merchandise. In the aggregate, these small thefts may be valued at only 1 per cent of a store's gross sales, but in a \$1,000,000-a-year organization this amounts to \$10,000. One chain-store system figured their unaccountable inventory losses (mostly to employees) at \$1,400,000 a year. Deception tests have proved valuable in reducing such losses

Finally, deception tests have been used in connection with other employment devices. Some police departments use the polygraph on prospective patrolmen. In East Cleveland, Ohio, all applicants for civil service positions must take a deception test to guard against the possibility of hiring persons who are falsifying statements concerning their background or have a questionable past. Keeler reports that the Chicago Park District Civil Service Commission examines policemen against whom charges are placed. The honest police officer welcomes the chance to exonerate himself, and the public is protected from actions of irresponsible public servants.<sup>14</sup>

## 10. SUMMARY

This chapter has focused on the evaluation of deception tests currently employed, especially in criminal investigations. All of those with scientific standing operate on the basic principle that deception is revealed by significant deviations in the normal physiological functioning of the organism. Considerable skill is required on the part of the examiner to control the examining situation and interpret the records. Alterations in the skin resistance, blood pressure, breathing pattern, eye steadiness, and the "Luria symptoms," either through extensive use in the field or in laboratory investigations, have proved of significance in diagnosis of truth and falsehood. The combined methods are probably far superior to any one used alone. Even though the legal status of the admissibility of such records in court is yet undecided, deception tests are of value to the police in their investigations of suspected offenders. More recently the tests have proved of considerable value in the commercial field in identifying petty pilferers and discouraging their practices.

## Chapter 17

### TREATMENT OF OFFENDERS

One of the topics most widely discussed with much heat and sometimes with little light, is the treatment given convicted criminals. On one hand are those who charge the courts are too liberal with short sentences, and the parole boards too generous with early paroles. The plea of these people is for longer and more severe prison terms. On the other hand are those who claim with equal heat that the prison sentences have a brutalizing influence, training the young or accidental criminal in more expert ways of crime. The conflict between these two points of view is, in part, attributable to a misunderstanding of the precise objectives of punishment procedures. What end is to be achieved by imprisonment or execution, probation or parole?

Historically, punishment was first for vengeance alone. Under this assumption it was merely necessary that the offender should suffer in precisely the same way and to the same extent as the person injured. Determination of punishment was relatively simple according to this principle. Gradually supplanting the notion of vengeance was the belief that the treatment of offenders should directly or indirectly protect society. This is still one of the important aims of punishment.

In addition, many penal practices today are directed at two other objectives which are sometime incompatible. The first of these objectives is to deter others from engaging in criminal pursuits. The second is the reformation of criminals so they will return to normal life better equipped to discharge their obligations as regular citizens. As the following discussion will reveal, the practices that deter crime are sometimes those that also prevent reformation.

Ideally, any system of treatment should accomplish the protection of society by deterring those not immediately treated from

engaging in criminal behavior and by reforming those criminals already in custody.

It is the purpose of this chapter to discuss the psychological principles that apply to the problem of punishment and then examine current practices to gain some insight into the extent to which these practices and psychological principles harmonize with the aims just mentioned. Can the desired ends be achieved with the existing methods of treatment? Are those methods of treatment making good use of psychological principles of punishment? For the most part, the discussion will be concerned only with those criminals who are guilty of intentional crimes of a relatively serious nature, rather than the traffic violator, misdemeanor, or the accidental offender punishable by fines or short sentences.

### 1. PSYCHOLOGICAL PRINCIPLES OF PUNISHMENT

The psychological principles which are applicable to the problem of punishment are not the result of detailed, systematic studies directly involving criminals, but rather have been deduced from a host of observations of children and adults. It is somewhat unfortunate that psychological studies of prisoners are notable by their scarcity. At the same time, there is good reason to assume that the general laws of human conduct are applicable to criminals even though few investigators have bothered to check this assumption.

One of the conditions contributing to the effectiveness of punishment is its immediacy. Studies of human and animal learning show that as punishment is delayed progressively, its beneficial effects are diminished. Consequently, if criminals are to be punished for any reason other than retribution, they should receive punishment as quickly after the crime as possible.

Punishment should not only be immediate but also invariable to have its maximum effect. In terms of the law, this factor refers to the certainty of conviction. A study of college students showed that some were deterred from committing crime more by the certainty of conviction than by the severity of punishment.<sup>1</sup> The extent to which the present machinery of justice and apprehension fails in taking advantage of this psychological principle is at times depressing. For instance, it has been estimated that the number of convictions for burglary and robbery is probably less than 10 per

cent of the number committed. In Chicago, five out of every one hundred felony cases received a conviction for the offense charged, although fifteen more were convicted on other than the original offense. Milwaukee has the best record in this respect, with sixty-three convictions for every hundred felonies.<sup>2</sup> Probably, in present-day complicated society, one cannot hope to attain a high degree of certainty, but it is unquestionably true that intentional crimes would be reduced to the vanishing point if the police and courts made it impossible for the offender to escape his just deserts.

It is, of course, desirable that the particular treatment given offenders should be selected with a view to its corrective effects. It is not sufficient to have criminals repent or to impose severe sentences in the hope that they will change their habits for the better. Some effort must also be made to discover the causes of criminal behavior and to guide the individual positively along paths that are more socially acceptable. In the field of education it has been found that students improve more rapidly in English composition if they are informed of their specific errors and ways of avoiding their mistakes rather than merely receiving an over-all grade. Corrective punishment directed at special causes of criminal behavior is obviously more satisfactory than purely punitive punishment.

A corollary to the principle of corrective punishment is the proposition that treatment should be adapted to the individual criminal. Gilbert and Sullivan's insistence that the punishment should fit the crime may be satisfactory for comic opera but not for present-day practical affairs. Instead, the punishment should fit the criminal. A given program of treatment that would be tremendously effective both in its deterrent and reformatory effects for one person, might conceivably be without beneficial effects on another. There are, for example, individual differences in susceptibility to monotony discussed in a previous chapter. The monotonous character of prison life is supposed to be one of its deterrent features. However, it is reasonable to expect that some prisoners may actually prefer the regulated prison routine life where personal decisions are reduced to a minimum. At the opposite extreme are those who go "stir crazy" largely because of this same feature.

Finally, punishment should be sufficiently irksome, painful, or costly so that the individual will subsequently follow the socially

acceptable rather than the unacceptable course of action. This principle was often ignored during the prohibition era when comparatively light fines were imposed that were merely added to the overhead costs while proprietors opened at new locations. A more frequent mistake has been to overestimate the effectiveness of this principle, at the expense of the other mentioned. In times of war, when crime frequencies usually mount and ordinary law-enforcement agencies are less efficient, governments have attempted unsuccessfully to control crime by increasing the penalties. Significant in this connection are the stories of early pickpockets plying their trade in the crowds witnessing the public executions of other pickpockets. Some studies of human and animal learning show that punishment may be too severe. In these instances, the organism is thrown into a panic, becomes uncoordinated, and fails to progress. Apparently there is an optimal degree of severity, beyond which it fails to produce the desired result.

These are the psychological conditions that determine the effectiveness of punishment. It would be a mistake to conclude that they are all applicable with equal ease, or that one kind of treatment will work satisfactorily in all cases. On the contrary, the fact of individual differences in adaptability, in intelligence, in emotional stability, and in a host of other respects makes it necessary that many possible avenues of treatment be considered if the objectives of punishment are to be attained in each offender.

## 2. TREATMENTS

In this section will be examined the more important ways in which criminals are treated following conviction in an attempt to discover how well the various programs accomplish the ideal aim of punishment and to what extent they make use of the psychological principles of punishment.

### *Imprisonment*

How effective is imprisonment in deterring others and reforming those imprisoned? By itself, segregation from normal contacts is relatively ineffective as a reformative measure. One must remember that prisons and reformatories were the gradual outgrowth of jails designed merely to detain persons until convicted or until they

were whipped, mutilated, or executed. Jails consequently had, and continue to have, no reformatory function. Prisons and reformatories, on the other hand, in addition to restricting the liberties of criminals are committed to a greater or less extent to some sort of occupational program. At the lowest extremes are the simple county workhouses where the prisoners are set to work usually at heavy unskilled, or semiskilled labor. At the other extreme are those Federal and state reformatories with elaborately planned programs of vocational education, embracing a fair representation of the trades ordinarily open to the kind of men or women in the institution. San Quentin Prison in California encourages prisoners to enroll in the University of California extension correspondence courses. At one time, nearly one-third of all the inmates were so enrolled. In the face of such a wide range of reformatory efforts within prisons, it is obviously impossible to make any clear generalizations concerning the effectiveness of imprisonment in the abstract. There is reason to believe that as efforts designed to teach a convict a useful trade increase, the reformatory aims are more nearly achieved.

*a. Prison Employment Policy.* However, blind acceptance of this tentative conclusion has resulted in much wasted effort. The Gluecks found that the boys released from the reformatory seldom follow the trade learned in the reformatory. It must be obvious to anyone familiar with modern employment principles that the usual practice of assigning prisoners to particular jobs with little consideration for the prisoner's aptitudes or interests defeats the essential purpose of occupational training. It is essential in any penal institution that prisoners be distributed among the various jobs according to the best principles of employment psychology. This means in essence that all incoming prisoners should be thoroughly examined and interviewed to discover what particular job best suits their abilities and personalities. Without this guidance, occupational training in reformatories will not reform.

*b. Special Institutions.* The capacity of the prisoner to assimilate training and readjust his mode of living is an important consideration. Accordingly, special institutions have been established to care for various kinds of offenders. As recently as a hundred years ago there were few special institutions for the insane or the feeble-

mined. Those abnormals and subnormals in public custody were mixed indiscriminately with criminals languishing in jails of unbelievable filth. In a number of states, institutions have become extremely specialized so that today one may find separate institutions not only for youthful and adult criminals, but also for the criminally insane and the feeble-minded delinquent. Each of these institutions is especially equipped to deal with the unique personnel problems presented to it. Schools for delinquent feeble-minded can expect little improvement in the individuals committed to them. Consequently, the program of social and occupational rehabilitation need not be extensive in such institutions. Somewhat similar differences are found between other of the specialized agencies. However, even the existence of special reformatories, prisons, "industrial schools," and colonies for the feeble-minded, do not completely solve the problems of adjusting the reformatory program to the individual's capacity. Within any given prison, for example, one can find wide individual differences. Most progressive institutions have a classification committee, usually consisting of the chief administrator or his assistant, a physician, psychologist, chaplain, director of education, maintenance supervisor, and perhaps one or two others. It is the function of this committee to outline the prisoner's special tasks in the light of all available information. Some institutions make a regular practice of reexamining each case at six- or twelve-month intervals. Procedures of this kind are in harmony with the principle that punishment should fit the criminal.

*c. Length of Sentence.* Another factor contributing to the effectiveness of imprisonment is the length of the sentence. Two trends are noticeable within recent years in this regard. The first is the increasing use of indeterminate sentences under which only the maximum and minimum limits are set. The exact period that the prisoner shall serve is consequently not determined at the time of sentencing. The second trend is the gradual increase in the length of sentences. From the standpoint of the psychologist, the first of these trends is fortunate. Ideally, a criminal ought to be detained until he shows evidence that he can conduct himself properly when released. The length of time required for such reformation cannot be accurately determined far in advance. Studies of the after careers



of criminals show that for some, detention beyond a given period is deleterious to later adjustment.<sup>3</sup> With this fact in mind, one may question the wisdom of extending sentences. A more reasonable procedure would seem to be to lengthen the range over which release from the institution is possible.

*d. Transfer Effects.* The effectiveness of imprisonment in reforming the prisoner depends upon things other than the opportunities for vocational training, the length of sentence, the capacity of the inmate, and the efforts to adapt treatment programs to individual differences. Probably the most important single aspect of prison life affecting reformation is the extent to which desirable habits of thought and action are developed that will carry over to life "outside." Expressed in terms of educational psychology, there must be some transfer of desirable habits from prison to normal life. Anyone convinced of the necessity for reformation will accept without question this last proposition. But the practical implications of that proposition have been vehemently resisted and actively opposed by large portions of the unthinking, well-intended public.

A brief examination of prison and normal life shows many sharp contrasts. Prisons regiment all men to an almost unvarying daily schedule. Meals are in silence. All clothing is of the same color and tasteless design. The recreational program must fit the standard schedule. In spite of existing efforts to allow for individual differences, there still remains a marked tendency to level all inmates to the lowest common denominator. Significantly, one of the guards at a well-known penitentiary remarked to the author, referring to the prisoners, "You can't trust a one of 'em." Prisons and reformatories provide little opportunity for the exercise of initiative; there is little reward for a job well done; indifference abounds.

If prisons are to be really effective in training for transfer, they must somehow or other make the conditions of training similar to the conditions under which the skills and habits are eventually used. Responsible prison officials have many times lamented the fact that obedience to prison rules and routine is uncorrelated with law observance in normal life. If transfer of habits is to take place from one situation to the other, the elements common to both must be increased. In the abstract, few will object to these principles,

but the concrete practices aimed to apply the principles are contrary to the public's conception of prison programs.

Specifically, then, prison industries ought to be similar to, but not identical with, "free" industries in maintaining labor morale, in providing rewards, in caring for grievances. Some freedom of choice ought to be permitted under conditions similar to the "outside." Hours of rising and going to bed might be left more to the prisoner's discretion, with penalties of a rather natural sort if the liberties were abused. A college student may lose his breakfast or get a "cut" if he oversleeps. May not some similar system work in a prison? The workman in a factory must punch a clock on his way in and receives some kind of penalty if he is late. Is it too much to ask prisoners to demonstrate while in custody that they can manage their own affairs in like manner?

*e. Objections to Prison Reform.* A prison run according to these methods would be the butt of furious attacks by a public that only recently opposed prison libraries and athletics. Yet, if prisons are to improve in their reformatory efforts they must move in this direction.

The usual objections to the suggestion that prisons be made more like "outside" life call attention to the inevitable decrease in the deterrent effects of imprisonment that would result. If a sentence to prison meant a more enjoyable life than living as a free man, then, of course, few people would inhibit their criminal tendencies. Consequently, efforts to make prisons similar to normal life have to be tempered with some consideration for the first of the psychological principles mentioned in the previous section. That is to say, the treatment of offenders must be sufficiently severe to impel socially acceptable, rather than unacceptable behavior. Frequently one finds that practices designed to reform do not deter, and prison officials must constantly strike compromises between the two objectives.

*f. Objections to Prison System.* Prison systems and administration have been open to attack from several angles. Prominent among the objections has been the charge that amateur first offenders often learn the ways of crime from repeaters with whom they are forced to mingle. The extent of "criminal infection" within prisons is not known in precise terms, but prison authorities are in agreement

that many second offenders are such largely because of this factor. A more rigid system of classification and further specialization of correctional institutions seem to be partial solutions to this problem, but even if such improvements were made, some transfer of information from one prisoner to another could not be prevented.

Still another objectionable feature of prisons is the necessary thwarting of normal sex expression. Many of the men and women in prisons have lived irregular lives unrestrained by high moral codes, church, or conscience. Confinement and enforced idleness for such persons leads almost inevitably to unnatural sex perversions. Some prisoners find temporary escape through drugs that are smuggled into many large prisons in spite of the vigilance of the guards. Again, a partial solution to this condition can be found in a constructive prison program that stimulates wholesome interests and consumes a large part of the individual's energies.

*g. Summary.* Do prisons reform? Do prisons deter? The answers to these questions are important for the future welfare of society. But the questions cannot be answered dogmatically in the abstract. Some prisons are more effective than others. The extent to which the unfavorable features are suppressed and the favorable features are enhanced, determines the effectiveness of each particular institution. What few reliable statistics are available show rather surprisingly large numbers of unreformed criminals. Of a thousand delinquent boys released from a New Jersey reformatory between 1924 and 1928, only 53 per cent were known to have lived reasonably satisfactory lives up to 1934. Another 14 per cent could not be located and approximately 4 per cent were either dead or in institutions for the feeble-minded, insane, epileptic, or tubercular. However, only 11 per cent were known to be in other penal institutions within the state.<sup>4</sup> This is one of the most favorable records that has been reported from American institutions. In England, before World War II, the very progressive "open" penal institutions known as "Borstals" found that of the boys released without other previous institutional experience, 71 per cent adjusted satisfactorily. A more general notion of conditions in the United States can be gleaned from the fact that 48 per cent of offenders committed to jails, prisons and reformatories in 1933 had previously been committed to like institutions.<sup>5</sup>

The prison system, of course, should not be blamed entirely for the high rate of recidivism. Lack of reformation may reflect in part unfavorable home surroundings canceling the reformatory efforts of the penal agency.

Prisons and reformatorys—at least in England, and probably also in the United States—seem to have contributed to a progressive deterioration by habituating repeaters to prison conditions. This conclusion comes from the fact that a large proportion of “first timers” are not reconvicted, but of those who do return after a second offense many come back to serve third, fourth, or fifth sentences.<sup>6</sup> The 1936 statistics for Massachusetts show that the average number of previous commitments for the repeaters was 5.6.<sup>7</sup>

All things considered, the prison system has not been a great success in either deterring or reforming criminals. However, there is reason to believe the system can become more effective if proper steps are taken to provide for more individual treatment with greater transfer values to normal life.

### *Parole*

Intimately related to prison effectiveness is parole. The ordinary citizen is frequently confused as to the precise meaning and intent of this practice which has grown in favor during the past twenty-five years. When a person is placed “on parole” it means that he has been released from some penal institution but is at least theoretically under the supervision of some agency designed to rehabilitate him. The theory of parole is not aimed at reducing punishment or in any way coddling criminals. It is purely an attempt to guide convicted criminals who have already “served time” so that they will make a better adjustment to their restored freedom.

The public attitude toward parole has been more antagonistic than sympathetic in many quarters. This reaction stems from the wide publicity frequently given the few parolees who have committed further crime while under supervision. These have been the glaring exceptions in many cases that editorial and magazine writers have seized upon to substantiate the thesis that parole is a failure. But what are the facts? What psychological principles of reformation does the parole system employ and what principles have been neglected?

*a. Extent and Effectiveness of Parole.* Important in any discussion of parole is the fact that the parole system of one state differs in policies and practices from nearly every other state. In one area, prisoners automatically are placed on parole at the expiration of the minimum sentence. In other states, they must meet stringent requirements so exacting that only about 20 per cent are ever placed on parole. Some states have a large staff of parole officers who personally interview their parolees; checking on working and living conditions at frequent intervals. Other states require parolees to report by mail virtually at their own initiative. In the light of these great discrepancies in administrative policies it is manifestly meaningless to consider the effectiveness of parole on a national scale. A number of statistical reports are available from states where the system has been well developed, showing the extent to which parolees are responsible for crime.

In the District of Columbia, during the year 1938, 771 convictions for felonies were recorded. Only four of these were committed by parolees.<sup>8</sup> During a recent two-year period, the state of Wisconsin placed 1830 prisoners on parole. Of these, 299, or 16.3 per cent, violated the technical conditions of their parole (failure to report, continued unemployment, associating with fellow parolees), but only 3.3 per cent were convicted of new crimes.<sup>9</sup> At about the same time, the record in New York state was similar. Only 9.4 per cent of 2257 parolees released in 1934 and followed over a five-year period were convicted of felonies; another 8.1 per cent were convicted of misdemeanors and 18.3 per cent were returned to prison for technical reasons. Thus, over a period of five years, more than 64 per cent of the 1934 parolees led satisfactory lives, while a total of nearly 83 per cent were not convicted of any crime.<sup>10</sup> Statistics of this sort could be continued showing that where the best principles of parole are followed the system is justified.

*b. Reasons for Success.* The true significance of these figures is not immediately apparent. In making any interpretations one should bear in mind that parolees were formerly convicts and have been exposed in many cases to the ills of the prison system. As has been pointed out previously, the prisons have tended to prevent rather than aid rehabilitation. Moreover, the lot of an

ex-convict is not an easy one. Legitimate employment is often barred to him by employers unconvinced that human conduct can be changed. These factors have unquestionably contributed to many parole failures, but in spite of them the recent record of the parole system under proper administration has been heartening.

It is not difficult to discover the psychological reasons for the relative success of the system. In the first place, whatever is done for the parolee by the supervising agency is usually aimed at rehabilitation and reformation. The punitive aspects are reduced to a minimum. Second, reformation is taking place in the normal surroundings of everyday life rather than in the highly artificial atmosphere of a walled prison. The shift from parole supervision to complete freedom is not accompanied by any necessary shift in loyalties, attitudes, habits, or associates, as is the case when persons are unconditionally released from prison. In terms of the psychology of learning, the conditions of reformation (learning) are nearly identical with the conditions of use making possible a greater transfer of training.

*c. Parole Prediction.* One of the most interesting advances in administration within the last decade has been the development of "parole prediction tables." This effort has a special interest for the psychologist since it is aimed at predicting human behavior within broad limits. The work is still in the controversial stage but has advanced to the point where it merits considerable attention. Essentially the technique attempts to predict a parolee's chances of adjustment on the basis of known characteristics in the individual's history.

A number of studies have shown factors favorable and unfavorable to parolee success. For example, offenders arrested for the first time before their eighteenth birthday are poorer risks than those arrested for the first time after their twenty-second birthday. Short-term prisoners are more likely to make successful adjustments on parole than long-term prisoners, although the type of crime committed is not generally related significantly to parole success. A study of the outcome of 90,000 parolees showed violation rates to be greater in Negroes than whites; unmarried than married persons; recidivists than first offenders.<sup>11</sup> Using statistical data of this kind, a list of twenty-one factors was compiled that appar-

ently affected to a large extent the probable success of the parolee. The factors were: offense, sentence, time served, age, nationality, marital status, type of offender, previous record, punishments, prosecuting attorney's statement, neighborhood, family, work record, intelligence quotient, personality type, psychiatric prognosis, associates, work when arrested, social type, mobility, and community. The following table was then constructed and has been used by parole boards at Joliet and Stateville penitentiaries in Illinois as an aid in granting paroles.

*Table 19. Parole Prediction Scores<sup>12</sup>*

<i>Number of Favorable Factors</i>	<i>Average Per Cent of Cases Succeeding</i>
2—3	14
4—5	35
6—7	40
8—9	57
10—11	72
12—13	89
14—15	97
16—17	98
18—19	99

The above table is merely an example of the way in which several investigators have arrived at predictions of parole success. In other localities, different factors have been used but the essential process has been the same.

How successful have these tables been in actual practice? One institution using tables of this sort showed a violation rate in a thousand cases that was 24.4 per cent less than would be expected in one thousand parolees released according to the conventional processes. In another institution the rate was 40 per cent less than expectation.<sup>13</sup>

Part of the explanation for these unusually favorable results is found in the fact that the parole officers were supplied with the expected rate of violation on each parolee and made special efforts to prevent failures where the expected rate was high. This fact points then to a second benefit of the prediction tables. Not only are they of some value in making the initial selection of parolees, but, equally important, they make it possible for parole supervisors to spread their efforts more efficiently, giving extra supervision where it is needed.

Not all parole agencies are inclined to value prediction tables. The Federal Parole Board, which passes on all cases released from United States penal institutions, has found that a "common-sense" approach to each case has enabled them to distinguish between good and poor parole risks with an accuracy that compares favorably with those boards making use of the tables. It may be that one factor accounting for the superior record of the Federal Parole Board is the high caliber of men on the board, and the superior type of case history that is submitted to the board with each case presented for consideration. The state boards, on the other hand, without the necessity for determining the factors involved in the prediction tables, are less likely to make a thorough case history. Consequently, the use of prediction tables (which in practice are not the sole basis for granting parole) forces the administrative board to make a rather exhaustive study of each case that may in the last analysis be the reason for the selection of the good risks.

The prediction tables used in the studies mentioned above have not escaped criticism. If one examines the factors considered in establishing the tables it becomes evident that nearly all refer to the convict's past record. Efforts are currently directed at enlarging the basis of prediction by including personality factors and evaluations of the parolee's aims and level of aspiration.<sup>14</sup> The value in practice of these additional considerations should prove high, but has yet to be demonstrated.

*d. The Future of Parole.* One of the most baffling problems at the present time in connection with parole is the disposition of those prisoners who have slight chance of succeeding on parole. The tendency in the past has been to hold them incarcerated until the expiration of the maximum sentence, on the theory that their release would expose society to unnecessary risk. This practice, however, has in effect made it possible for the most dangerous criminals to be liberated without any supervision whatever, since the jurisdiction of parole ceases when the maximum sentence expires. In consequence, criminals with the most need for something like parole supervision are being granted unconditional release and society thereby being exposed in the end to even greater risks.



One possible solution to this problem, rooted in sound psychological principles, lies in an arrangement whereby all prisoners would be under parole supervision for a period proportional to the length of time served. Those with short sentences and a large amount of time deducted from their minimum sentence for good behavior would be under supervision only a short while. Those serving long terms and presumably in need of greater reformation would then be placed on parole for a much longer time. A double incentive would thereby be offered a prisoner to adjust himself to prison routine and demonstrate his "parolability." Good behavior would reduce the time served, and the period of parole.

The most promising line of future development in parole seems to be in the direction of greater coordination of the prison and parole systems. Such coordination demands not only that the administrative but, more important, the reformatory effects of the two systems be coordinated. In some progressive penal institutions the prisoner meets a parole officer within a few days after his admission. The officer explains the need for adjustment to prison routine, the conditions on which parole is granted, and begins to prepare the prisoner for his eventual release. So-called parole classes continue for the duration of the man's stay in prison. A procedure of this sort tends to bridge the differences between the systems, making the transition from highly restricted behavior to complete normal freedom a gradual one. From the psychological standpoint the gradualness of that transition is highly important if the habits of action and thought learned in the early period of treatment are to be transferred to normal life.

Summarizing, it can be said that parole in theory and as practiced in many states with well-organized staffs is vastly superior in its reformatory effects to the system of unconditional release from imprisonment.

### *Probation*

Probation is one method of treating offenders which has been growing in favor for some years. In some respects, the method is similar to parole, particularly in regard to the fact that probationers are permitted the freedom of their community but must remain under the guidance of some agency to which they must

report regularly. Probationers, however, differ from parolees in that the former have not been committed to any penal institution for the offense occasioning treatment. In many sections the parole and probation departments are fused even to the extent of particular officers having both parolees and probationers to supervise.

*a. Extent and Mechanics of Probation.* The extent of probation is somewhat wider than generally recognized by the lay public. For the fiscal year 1936-1937, the Federal courts placed 35 per cent of all cases on probation. Reports from thirty states on more than 55,000 defendants sentenced in 1936 showed 31 per cent were given either probation or suspended sentences.<sup>15</sup> (Suspended sentences are not the same as probation, differing from the latter in the fact that no supervision whatsoever is provided for the convicted person.) No general statistics on probation alone are available for the United States.

The decision as to whether or not a particular offender is to be placed on probation is made by the judge. He is limited in most states by statutory provisions that prohibit persons guilty of certain offenses from probation. In some states, persons guilty of first-degree murder, arson, sex offenses, robbery, or use of a deadly weapon, cannot be placed on probation. In spite of these limitations placed upon the judge, he often has a rather wide area of discretion.

As a practical matter, this area of discretion is both a strength and weakness in the system. In order for the system to succeed, detailed studies of each candidate are necessary, but usually are not required by the laws establishing probation. Judges burdened with the normal duties of office have neither the time nor training to make detailed personal studies of each defendant. Consequently, reliance must be placed upon trained investigators to supply the judges with case-history material and recommendations for probation previous to the time for sentence. Without this aid the system cannot hope to achieve marked success. In some jurisdictions the judge frequently exercises his right to place defendants on probation without an investigation, thereby rendering the system vulnerable to justified criticism.

On the other hand, if judges were not given some discretion it would be necessary for legislatures to establish a rigid system of

penalties for all crimes under all conditions. The wit of man is not sufficiently keen to devise such a system that would fit the numberless combinations of personalities and circumstances met in all courts of a given commonwealth. Some judicial discretion is consequently necessary. Precisely how much is desirable is debatable.

*b. Success of Probation.* The success of probation as a reformatory influence is affected by essentially the same factors affecting parole success. These factors can be discussed conveniently under the headings: selection of candidates, quality of supervision, personal history, and socioeconomic conditions.

The mechanics of selection has already been mentioned. The Attorney General's survey of probation in the United States revealed that one of the chief difficulties in the way of more successful probation lay in the inadequate facilities many judges had for securing the information necessary in making wise selections for probation. In some instances, the judges relied upon "hunches" or upon haphazardly obtained recommendations from friends of the defendant. Either method is obviously open to numerous criticisms. However, where the available technical assistance is capable of corraling reliable information on the defendant's previous history, his associates, work habits, and general manner of living, successful probationers are selected with greater accuracy.

The quality and intensity of supervision greatly influence the success with which probationers readjust themselves following conviction. A study of 2819 Wisconsin probationers examined the relationship between success on probation and 28 factors in the life histories and treatment of the probationers. The second most important factor was the number of contacts the probationer made with his supervisor per month. Eleventh in the list of twenty-eight factors was the education of the supervisor.<sup>16</sup> In other words, both the frequency and quality (assuming that the better educated supervisors showed greater understanding and gave wiser counsel) of supervision bear a rather definite influence on the probationer's adjustment.

Evidence indicates that the offender's past is a highly accurate indicator of his future. For example, in the study of Wisconsin

probationers just mentioned, factors one and four, in order of importance, were respectively employment and history of previous arrests. Those who were employed and had no record of previous arrests were more likely to succeed on probation than those who were not employed and who had previously been arrested. The Attorney General's report, based on 19,000 cases, agrees in substance with these findings. In addition, those under twenty-five years of age tend to violate conditions of probation more frequently than those over thirty-five. Married persons, irrespective of the number of dependents, are inclined to violate less frequently than single, divorced, or separated offenders, while Negroes and native-born whites seem to have poorer records than foreign-born whites. Contrary to popular opinion and, more important, contrary to the apparent assumptions underlying many of the legislative limitations of probation, the least important factor studied by the Attorney General's staff was the nature of the crime. In some areas where statutory limitations are absent, the sex offenders made as good probation records as any other class of criminal.

The investigations that have sought to determine the chief factors affecting the outcome of probation indicate anew that the most successful reformatory efforts must be guided by the nature, personality, and individual status of the offender. The kind of offense committed is some indication of the offender's personality, to be sure, but the offense reveals only one facet of that personality. Only after extensive study of the individual offender from all angles can intelligent decisions be made as to the best method of treating him. A criminal code that ignores individual differences between persons guilty of the same offense is geared to the folk psychology of a past generation. It cannot achieve much reformation of the criminal.

*c. Advantages of Probation.* The psychological advantages of probation over imprisonment are much the same as those possessed by the parole system. Basically, the offender's reformation takes place in the same environment in which he will be called upon to make his own decisions after the sentence has expired. He learns, while on probation, to avoid those conditions that contribute to his criminal behavior. The circumstances of this learning are much the same as those that will prevail when supervision is relaxed.

While the theory of probation meets most completely the general psychological requirements for effective reformation, one must not conclude that probation is the best treatment for all offenders. It is quite possible that many criminals today are beyond hope of reformation by means of existing techniques. Such persons might well be imprisoned for life. To advocate probation for all would be to ignore many important individual differences whose existence is one of the best psychological reasons for advocating probation for those suited for it.

*d. Arguments Against Probation.* One of the most important arguments against probation declares that the practice results in light, punitive actions which do not satisfy the desire for revenge on the part of the injured individual. Consequently, there is little incentive to press the charges. The argument has some merit but ignores two important considerations. First, one of the conditions of probation in many instances is the restitution of the stolen, damaged, or destroyed goods which the complainant lost. Consequently, some satisfaction is granted the injured person. In the second place, the desire for revenge is not necessarily immutable. On the contrary, some evidence suggests that desires and longings of no immediate biological consequence, such as revenge, love of artistic beauty, even special food preferences, are the product of special social conditions. Within the citizens' power are the means for altering those special conditions so that other more compatible desires are generated. In regard to the desire for revenge in criminal actions, a complementary desire is already manifesting itself in those people who refuse to prosecute because they feel imprisonment is a degrading, sordid treatment that does not correct or rehabilitate the offender. It is possible that in the future more people, in bringing criminal charges, will be motivated not by revenge but by more humane desires. Under such circumstances the best reformatory procedures would then provide complete satisfaction for the complainant.

By way of conclusion is an excerpt from the Attorney General's report to which reference has already been made.

The advantages of probation as an aid to crime prevention and the rehabilitation of offenders far exceeds in importance its weaknesses and defects. Prisons are a success as custodial institutions for dangerous

criminals, but as forces for rehabilitating offenders they stand as sordid reminders of failure.<sup>17</sup>

### 3. SUMMARY

Discussed in this chapter were the three principal ways in which offenders are treated following conviction: by imprisonment, parole, and probation. The chief psychological principles that contribute to changes in behavior wrought by punishment techniques were also outlined. Specifically, if punishments are to have their maximum effect they must (1) come immediately and (2) occur regularly after the offense, (3) must be corrective in their effects, (4) must be adjustable to individual differences and, finally, (5) must be sufficiently irksome or painful so that the more socially acceptable ways of action will be preferred. These are the ideal psychological conditions that are never completely satisfied by any of the existing practices.

The first two of the above factors, namely the immediacy and regularity of punishment, are beyond the control of penal institutions except where the offenses in question are those committed while in custody. The system of court procedure and the cumbersome machinery of justice are such as to delay the administration of punishment sometimes for years after the commission of unlawful acts. This same machinery with its highly technical procedure provides many loopholes through which the guilty may evade the law. In addition, the ineptitude of some county constabularies and small local police departments enables some criminals to escape apprehension. Much of the deterrent value of punishments is dependent upon the immediacy and certainty of conviction. Ways by which greater immediacy and certainty can be achieved are largely administrative with few psychological problems and are consequently outside the realm of the present text.

It has already been noted that most penal and correctional institutions are probably poorly equipped to reform effectively those who are imprisoned. Too often one encounters among prison officials the attitude that prisons must break rather than remake a man's spirit. In the more progressive institutions some provisions are being made to adapt the available reformatory factors to individual differences. However, there is still much room for progress

in this regard. One of the best reformatories in one of the most progressive eastern states has only one industrial training project aside from the general maintenance functions of the institution. On one psychological principle of punishment the prisons have consistently scored well; they have made punishment sufficiently irksome and unpleasant so that for some, at least, the socially acceptable forms of behavior are more desirable. However, it must also be noted that unduly severe treatment may and has generated feelings of revenge in prisoners which find expression in still further crime upon release.

Parole and probation are relatively new ways of treating offenders. In general, these procedures take greater advantage of the third and fourth psychological principles of punishment than imprisonment. Under good administration, extensive efforts are made to discover the precise program of guidance which will have the maximum corrective effect on each particular individual. Parole and probation are admittedly not designed to produce irksome or painful experiences but one should not suppose either program is without its unpleasant aspects for the offender. The necessity for reporting and the knowledge of being under supervision is an annoying fetter to many. When offenders are properly selected these procedures have most nearly approximated the psychological objectives of punishment.

The survey of treatments accorded offenders has revealed that the public demand to deal severely with all convicted persons is at least shortsighted. Society in the long run will gain more protection if emphasis is placed on positive reformation rather than on punitive treatment. Until a large part of the responsible members of society recognize this fact, progress in harnessing psychological principles to the aims of punishment will be slow.

6. PSYCHOLOGY APPLIED  
*to Personal Problems*





# Chapter 18

## VOCATIONAL GUIDANCE

One of the chief problems facing high-school and college students is deciding upon a vocation. In our complex society, which offers a wide variety of occupational choices, and correspondingly great possibilities of failure, the problem is exceedingly difficult. In contrast, boys a dozen years old, reared in an isolated mountaineer community, were baffled when asked what they intended to be. For them the problem was nonexistent, for they usually answered, "I want to be what I am." They showed no knowledge of any other way of life except the familiar one of hoeing a little corn, occasionally shooting a "razorback" pig, and cutting enough firewood to keep warm.<sup>1</sup> For primitive people and persons with limited intelligence there is no problem of vocational choice. They just grow up.

### *Why Is It Difficult to Choose a Vocation?*

For those who reach the high-school and college level a wise vocational choice is made particularly difficult by a number of factors. The first has already been alluded to in calling attention to the great number of occupations. The most reliable estimate places the number of distinct occupations in the United States at about 17,000. This array is a formidable one to any young person facing the future with the earnest desire of making a wise selection.

Second, our democratic form of education is such as to limit training for specialized work until junior or senior high school. Even beyond this point it is possible to continue one's general education without taking courses specifically designed for a given kind of career. Consequently, our school system is such as to permit an individual to postpone his vocational choice without halting his general education. However, as the individual progresses

through the system to higher and higher levels, greater and greater opportunities are opened, making one's choice even more difficult.

Third, the growing demands for vocational advice made by students and anxious parents have opened the field of vocational guidance to charlatans who profess an infallible ability to direct young people into the fields for which they are best fitted. To those unacquainted with the tested techniques of vocational guidance it is difficult to appraise the counsel offered by the various types of vocational "guides." Various counselors often give conflicting suggestions to the same person, but the client has no way of shifting the wheat from the chaff. This conflicting advice complicates the problem. For these reasons the task of choosing a vocation in which one expects to spend a major portion of his life is a task productive of confusion, frustration, and uncertainty.

### *Vocational Guidance Defined*

The young person seeking vocational guidance will find that his problem breaks down into two main questions: (a) What are the requirements for success in each of the occupations I am considering? and (b) What qualities, abilities, or potentialities do I possess? In other words, vocational guidance is concerned with appraising the individual and finding that occupation whose demands most closely fit the personality and ability pattern of the individual.

Vocational guidance is related to, but distinct from, employment selection. The latter is concerned with picking a man from a group of applicants for a particular vacancy. Vocational guidance, on the other hand, attempts to find an occupation into which a particular individual will fit.

The task can be made more concrete by considering some of the specific questions under each of the two main problems given above. With regard to himself the individual may appropriately ask:

What is the level of my intelligence? Have I sufficient general ability to compete favorably with others in the occupations I am considering?

What special aptitudes or abilities have I that may be of value in some occupation?

What is the nature of my likes and dislikes, my aims and ideals, my interests, my personality pattern?

Have I any deficiencies or disabilities that limit the range of my vocational choice? Can any of these be corrected if necessary?

With regard to any special occupation the individual might ask:

What level of general education is expected of people who enter this occupation?

In addition to general schooling, how long a period of specialized training is ordinarily necessary? Where can I secure it, and how much will it cost?

What kinds of activity are most characteristic of this occupation? Do I like these kinds of things? Will the work and surroundings be congenial?

What are the average earnings of people in this occupation? What is the minimum, the maximum salary?

Is the employment relatively secure and steady?

What are the opportunities for advancement? Is the job a blind alley, or does it open the doors to other occupations?

What is the ratio of employment opportunities to the supply of competent applicants? How keen is the competition I should face?

Where does this occupation rank in social prestige? If I were to succeed in it, would my friends applaud, or would they look down on me for following it?<sup>2</sup>

This chapter will attempt to provide some principles that bear on the manner in which these questions are answered. However, before proceeding to that task, it may be well to point to some of the limitations and preliminary considerations of vocational guidance so as to forestall unwarranted optimistic hopes in the certainty and accuracy of the present scientific procedures.

## 1. SOME PRELIMINARY CONSIDERATIONS

### *Self-Guidance vs. Direct Guidance*

It may prove disappointing to some to learn that the basic decision as to which vocation one should enter must, by the nature of things, be the responsibility of the individual himself and not of the vocational counselor. None of the tested techniques of measuring abilities, desires, aspirations, and personality patterns is sufficiently exact to warrant any counselor positively directing anyone else into a specialized career. The counselor may indicate after a period of interviewing and testing a fairly narrow range of

occupations into which the individual may fit with a reasonable expectation of success. Positive recommendations of greater exactness are not within the ken of counselors skilled in the use of the best vocational techniques.

It becomes increasingly clear that the individual himself must make the final choice of a career. Those who shrink from that responsibility are demonstrating a symptom of maladjustment (see *Principles of Mental Health*, page 77). After the information about oneself and the prospective occupations has been assembled and interpreted through the help of a vocational counselor, his task is largely finished. Probably the willingness to make a decision and assume the responsibility for it contributes to the individual's mental health. Certainly an extended state of chronic indecision, of worry and anxiety about one's future occupation, is not conducive to well-balanced living. It may lead to a planless dallying without end.

What has just been said does not imply that vocational decisions must be made at the end of high school or necessarily at the end of college or at any other specific time. Moreover, there is no clear evidence at hand to indicate that decisions made at one time are more conducive to later success than decisions made at another precise period. One person, for instance, may simply decide at the end of high school to postpone a vocational choice until his general education and information about occupations is more extensive. Once these ends have been achieved and he also has a fairly accurate picture of himself, he should come to a decision fairly rapidly as to whether he will go into teaching, the ministry, scientific work, business or some other occupation. Some vocational counselors do, but reliable counselors will not, make that decision for others.

### *Negative vs. Positive Guidance*

What has been said in the preceding section applies primarily to "positive guidance," that is, recommendations to enter this or that line of work. On the other hand, vocational counselors are frequently certain of the occupations *not suited* to the individual. It is relatively easy to identify certain limiting factors that would prevent the individual from gaining a foothold in a given career. Deficient sense of rhythm or an inability to sense obvious differ-

ences in pitch would handicap anyone aspiring to be a musician. A dislike for indoor work, accompanied by poor visual imagery and feelings of irritation engendered by forced attention to small details would, in all probability, mitigate against a satisfactory adjustment as a draftsman, an artist, or perhaps even an accountant. Negative guidance, or the identification of occupations which the individual should avoid, can be much more accurate than positive guidance.

Of course, negative guidance also has its limitations. Even after those occupations are identified which are unsuited for the individual, ordinarily there are still left a great many careers which might be considered in a "doubtful" category. The process of elimination made possible through negative guidance cannot be carried to an extreme where all occupations but one have been discarded.

### *The Fallacy of the One Best Job*

The belief is widespread that each person is born for a particular kind of work. According to this notion, it is possible to attain satisfaction in only one particular occupation. In view of the great diversity of occupations, many of which differ from each other in only minor aspects, such a belief is scarcely justified. Consider, for example, the individual with a decided interest and ability in mechanical affairs. That interest could find satisfactory outlet in mechanical dentistry (making false teeth), in engineering, watch-making, automotive engine- or body-designing, and a great many other lines of work. There is no reason to believe that human beings are so rigidly designed from birth that their interests and abilities cannot be molded, within limits, to make for a satisfactory adjustment in a number of occupations.

Indeed the world of work is constantly changing. New occupations are constantly evolving and old ones are on the wane. At one time all electric-light bulbs were blown by human lungs. With the rapid spread of electric power, glass blowers came into demand. Technological developments eventually displaced them except for making fine glassware and art objects. Again, it will be recalled that before 1920 radio was a matter of dots and dashes for a few "gadgets" and laboratory scientists. Within five years, tens of

thousands of crystal sets were purchased and assembled and a new industry was launched, now employing engineers, musicians, writers, research men, advertising experts, comedians, news reporters, and a host of others. Few men or women among this great company of people ever heard of radio before they reached high school. Their interests and aptitudes were such that they could be molded to the demands of this new enterprise. For the student starting on his search for a career there is no one best job, but rather a number of possible jobs into which his talents will fit. In turn, the job will modify his interests and to some extent his abilities.

### *Need for Versatility*

The shifting occupational demands just referred to make it necessary to consider the ways in which an individual may, in a sense, prepare for unpredictable changes. In spite of the fact that specialization is the key note of the twentieth century, it is well to consider the possibility of choosing a vocation that is closely allied to other vocations not likely to be affected by the same social or economic factors. For example, a Y.M.C.A. boys' work secretary, in preparing for his career, took courses that would not only be of value in Y.M.C.A. work but also were related to the ministry and public school teaching. In the process of specializing he broadened his "occupational base," making it possible to shift rather easily from his first choice to either of the others with a minimum of trouble, should the occasion arise. Undue specialization may render an individual unusually susceptible to the ills of economic depression. On the other hand, the versatile individual (not the jack-of-all-trades-master-of-none) can turn his efforts into new channels when his speciality is no longer in demand.

Having considered the importance of self-guidance, the superior accuracy of negative counsel, the fallacy of the perfect job, and the need for versatility, it will be well to examine the personal characteristics that should be considered in vocational self-evaluation.

## 2. INTELLIGENCE AND OCCUPATIONS

One of the personal characteristics most easily measured by psychological tests is intelligence. Partly because of this fact it is

the one characteristic that has been related to a larger number of occupations than probably any other single psychological characteristic. Moreover, a person's level of intelligence establishes certain maximum, and occasionally certain minimum, limits on the range of occupations in which he may likely succeed. The evidence for this generalization comes principally from data collected during World War I when nearly a million men, coming from all walks of life, were examined on intelligence tests. The following figure is a partial summary of these data, showing the interquartile range\* and average, for a sampling of occupational groups.

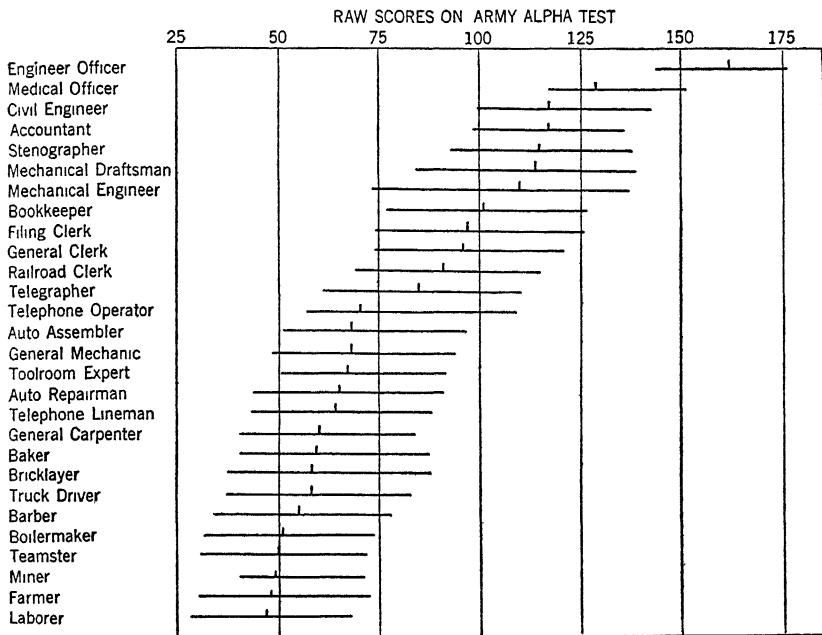


Figure 41. Showing Relation of Intelligence to Occupation. The long line defines the interquartile range of scores; the short vertical line indicates the average score. Adapted from H. E. Burt, *Employment Psychology*, Houghton Mifflin Company, Boston, 1926, 267.

A study of this figure shows two very important facts. Looking at the upper portion of the list it is clear that those with the

\*The interquartile range is a rough indication of the spread or variability of the scores. It is that range of scores obtained by the middle 50 per cent of the group tested. For further discussion of distributions of scores, see Chapter on Employment Psychology, p. 165 and the Appendix.



highest intelligence are professional people. Their occupations are such that a long period of special training is necessary. Next are the technical workers whose jobs require some original thought and a variety of special abilities. Down the scale further, beyond the clerks and mechanics, are found the jobs calling for less skill and fewer special abilities. At the lower extreme are the common laborers, the pick-and-shovel men. Data of this kind which have been verified by several subsequent studies suggest that each occupation has its own optimal intellectual requirements. Especially is it true that the professions and highly skilled occupations are generally peopled by those who have superior intelligence. Presumably those with low intelligence who may have attempted these occupations failed to survive the competition.

A second fact emerges from this figure. Each occupational group overlaps the distributions of other closely related occupations. Even though the average score decreases going down the list, one is not justified in concluding that all miners, for instance, are inferior to the carpenters. On the contrary, a quarter of the miners are superior to even the average telephone operator.\* The fact of this overlapping is one of the reasons why vocational counselors avoid a positive recommendation to enter this or that vocation, since a given intelligence level is found in a fairly wide range of occupations. On the other hand, it would be folly for a high-school student scoring only 100 on the Army Alpha to attempt a medical career. Thus this study of intelligence reveals something of the difficulties of positive guidance and the possibilities of negative guidance.

### *Can a Person Have Too Much Intelligence for His Job?*

It is a common belief that people with high intelligence are suitable not only for professional and technical positions but can also make satisfactory adjustments at the lower occupational levels. This belief is true to the extent that the superior intellects are capable of performing tasks of semiskilled occupations but the satisfactions derived by such misplaced intellects are inadequate. As a result the job becomes irritating, unpleasant, and irksome,

\*The top and bottom 25 per cent of each group received scores beyond the limits defined by the interquartile range indicated in the figure.

leading often to pronounced inefficiency. A number of studies have revealed that certain jobs are performed best by persons of limited rather than maximum intelligence. One objective indication of the satisfaction derived from a job is the turnover of employees. If a man likes the work he is likely to continue it longer than someone who is dissatisfied. The results of one study of turnover in relation to intelligence are summarized in the following figure.<sup>3</sup>

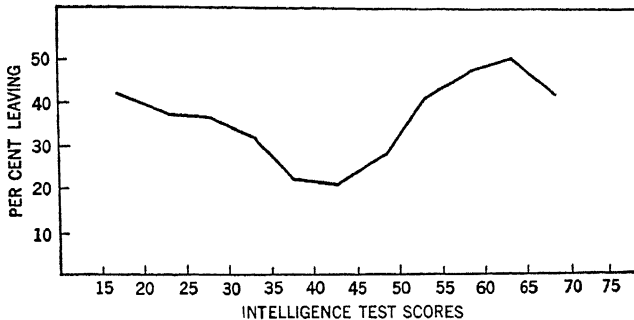


Figure 42. Showing Relation of Intelligence to Rate of Job Turn Over.

The figure shows that the minimum amount of turnover occurred among those in the middle portion of the intelligence range. Those with low scores presumably dropped out of the office work because the tasks were beyond their ability. At the upper end of the test range, clerks were more likely to leave the job because it was probably not sufficiently exacting or stimulating to hold interest.

The importance of finding a vocation that is neither too far beyond one's ability nor too easy, is shown by a survey of some three hundred men who applied to a bureau for vocational advice. It was discovered that 69 per cent had more intelligence than required by their previous occupations or the jobs held at the time of the application. Another 17 per cent had less intelligence than their jobs required.<sup>4</sup> It is reasonable to suppose that one of the factors contributing to the dissatisfaction of these men who were seeking advice was the inequality between their intellectual ability and the demands of their jobs.

From findings of this sort, persons with mediocre ability should take some encouragement. They mean that the real competition

in occupations is limited to only those people falling within a given range of intelligence. Those with superior intelligence are often as rigidly excluded from some occupations as those at the opposite extreme.

### 3. INTERESTS AND VOCATIONS

In addition to the factor of intelligence, interests are important determiners of vocational adjustment. Unsuccessful people frequently excuse their achievements by complaining that they are not interested in their work. An investigation of one hundred non-college persons dissatisfied with their work showed in general that their measured interest patterns were not congruent with their occupations.<sup>5</sup> On the other hand, persons who achieve some success and importance in their vocations are alike in finding their jobs absorbing. The essential problem facing the young person, however, is that of discovering his own basic interests and learning how these compare with the men or women engaged in various occupations.

#### *Strong's Vocational Interest Blank*

Fortunately, the last fifteen years have witnessed the development of procedures aimed at solving just that problem. The best known and most widely used of these is a questionnaire called "Strong's Vocational Interest Blank," composed of 420 items. The blank contains a number of occupational names, amusements, school subjects, peculiarities of people, and miscellaneous activities, each of which is to be checked either "Like," "Indifferent," or "Dislike." In addition, there are ten activities from which the individual selects the three he most enjoys and the three he least enjoys; ten factors affecting work from which are selected the three least and the three most important; ten eminent men, three of whom are to be checked as the ones whom "you would most like to have been," and three to be checked at the opposite extreme. The blank also includes a list of paired items to be compared in interest, and finally self-ratings on a number of personal characteristics. This blank has been filled out by successful persons in a number of different occupations, including many of the major professions. In this way it has been possible to discover the unique

pattern of interests that distinguishes one profession from another.

In using this questionnaire the advisee indicates his likes and dislikes. This pattern of expressed interests is then compared with the typical patterns for each of the professions. The final result of such an examination of interest is usually expressed by the letters A, B, or C, indicating the degree of similarity between the advisee's interest pattern and each of the occupations. One individual's report may look something like this:

Physician	B—	Sales manager	B—
Math-physical-science teacher	C	Real-estate salesman	B+
Engineer	C	Life-insurance salesman	B
Lawyer	A+	Advertising man	A+
Minister	C+	Artist	A
Soc. sci. high-school teacher	B—	Architect	B+
Certified public accountant	C	Dentist	B—
Mathematician	C	Psychologist	C
Chemist	C	Musician	A
Production manager	C	Author-journalist	A+
Personnel manager	C+	Y.M.C.A. secretary	C
City school superintendent	C	Office worker	C
Purchasing agent	C	Y.M.C.A. physical director	C+
Accountant	C		

This is a typical case illustrating the kind of results often obtained. A number of occupations emerge as having similar interest patterns to that expressed by the individual. In most cases an interest analysis of this sort is more indicative of the occupations which a young person should probably avoid rather than those which he might profitably pursue. In the table above, the occupations of advertising man, author-journalist, lawyer, musician, and artist are all rated as having the greatest similarity with the interest pattern of the advisee. Armed with this information it is still a difficult task to make a selection, even though the field has been narrowed. It may be that other circumstances will warrant consideration of those occupations rated B, especially if the requisite training, abilities, and opportunities of the A occupations are beyond the reach of the individual.

Regardless of the final scoring of this blank, it has another important function. As a young person goes through this, or any other similar blank, he is forced to evaluate himself on a number of items that probably escaped his notice previously. In other

words, an interest analysis provides an opportunity for self-study, important to any wise self-guidance.

The value of using inventories has been questioned at times because of the known factors tending to vitiate the results. First of all, the advisee may lack information about certain activities mentioned in the inventory. Perhaps he has never been in a position where he might borrow money and, therefore, does not know whether he would like to do so or not. He may not know what social service work involves and consequently cannot judge his liking for it. Second, he may profess an interest in those activities which are generally admired, or deny an interest in tasks which his family or friends might ridicule, regardless of his own real feelings. One boy may honestly like to tinker with machines, but may deny such an interest because his parents or friends have placed greater store by white-collar activities. Falsification of responses, however, is probably not an important source of error. Third, the individual may overgeneralize from a single experience. A person's success or failure in selling tickets to the high-school play or magazine subscriptions for a special Christmas premium ought not to be the sole basis for judging an interest in selling. Finally, the shifting pattern of one's interests from year to year has tended to reduce confidence in whatever long-term vocational recommendations might follow from an interest analysis.

### *Are Interests Permanent?*

This last problem has been the object of some investigation. It is apparent from studies in which the same persons have recorded their interests on the Strong blank on two occasions, separated by intervals of one to five years, that the dominant interests persist. This is especially true of persons beyond high-school years. Prior to that time the information, falsification, and overgeneralization errors are probably more in evidence. Typical of the findings in studies of this problem is the following table:

Table 20. Correlations between Scores Obtained on Two Applications of the Strong Blank Separated by an Interval of One Year<sup>6</sup>

	<i>Inventory Scored for Interests</i>				
	<i>Engineers</i>	<i>Physicians</i>	<i>Ministers</i>	<i>Lawyers</i>	<i>C.P.A.</i>
247 college freshmen	.91	.85	.79	.75	.62
150 high-school juniors	.83	.73	.68	.65	.55

A study of this table shows that the stability of interests in the college freshmen was greater than in the high-school juniors. Strong has also reported on the change in interest of more than two hundred men reexamined after an interval of five years. The average correlation between the first and second applications when scored for twenty-one occupations was .75. It appears, therefore, that interests as sampled by the Strong Blank are reasonably stable, particularly beyond late adolescence and early adulthood.

### *Thurstone's Primary Interests*

One of the chief objections to the Strong Blank from the administrative angle is the time and expense involved in scoring each of the 420 items for each of the 30 or more occupations. In order to overcome this objection and to bring order and system to the vast array of interests, Thurstone has applied factor analysis\* to the interest scores for eighty occupations. It is reasonable to expect that some fundamental interests should be common to certain "families of occupations." The artist, the advertising copy writer, the newspaper reporter, the teacher of English composition, all probably have some common interests. Thurstone's statistical treatment attempted to find and identify the clusters of interests that were distinctive for certain occupational families. His results indicated that eight factors were sufficient to account for the relationships existing between the eighty selected vocations. These eight factors are best described in terms of the occupations in which they predominate:

A *commercial interest* is found in: advertiser, auto salesman, banker, building contractor, certified public accountant, landscape gardener, manufacturer, office manager, club secretary, factory manager, florist, printer, private secretary, retail merchant, stockbroker, tax expert, and business manager.

A *legal interest* factor shows up in: judge, criminal lawyer, corporation lawyer, clergyman, congressman, diplomatic service, economist, foreign correspondent, public speaker, banker, historian, tax expert, and stockbroker.

An *athletic factor* appears in: athletic director, cattle rancher, newspaper reporter, explorer, forest ranger, press agent, professional athlete, radio announcer, secret service, ship officer, and army officer.

\*Factor analysis is an elaborate statistical treatment of intercorrelation coefficients designed to reveal the minimum number of variables (factors) and their relative importance in determining the relationships expressed by the intercorrelations.

An *academic factor* is principally found in: historian, librarian, mathematician, philosopher, college professor, economist, high-school teacher, psychologist, sociologist, and vocational counselor.

One of the most general interest factors is called "descriptive" because it is characterized by a general interest in people and things. It is found in: actor, advertiser, art critic, artist, journalist, musician, reporter, novelist, orchestra leader, philosopher, explorer, foreign correspondent, poet, press agent, psychologist, radio announcer, sculptor, secret service and diplomatic service.

A *biological factor* is found principally in: biologist, botanist, chemist, pharmacist, dentist, geologist, scientist, and surgeon.

A *physical-science factor* occurs in: architect, astronomer, building contractor, chemist, inventor, manufacturer, mathematician, engineer, philosopher, physicist, and scientist.

An *art factor* was suggested by the data but a sufficient number of art occupations was not included in the schedule to identify the factor with certainty.<sup>7</sup>

On the basis of this information Thurstone has constructed an interest questionnaire which need only be scored for the eight reference interests instead of the thirty-odd occupations in the case of the Strong Blank. The advisee's pattern of interest in regard to the eight factors can then be compared with typical patterns of successful men in various occupations that the advisee may be considering. The standardization work on this form has not progressed sufficiently for it to be widely used. Consequently, it cannot be evaluated except in terms of the initial advantage it possesses over the Strong Blank as regards ease of scoring.

#### 4. SPECIAL APTITUDES

The man or woman of superior general intelligence is not necessarily equally superior in special restricted aptitudes. That is to say, the capacities of a person can be examined from at least two angles. First, one may consider the general level of his day-to-day performance; the ease and quickness with which he solves problems and grasps new ideas; the extent to which he profits from experience. These are some of the marks by which to judge general intelligence. Second, one may consider his skill in music, in getting people to work for him, and with him, in assembling mechanical gadgets, in doing clerical work, in carrying on a conversation. These are examples of special aptitudes in which persons of a given level of general intelligence differ. At the moment there is no wide agreement as to the precise number of special aptitudes nor as to

the labels they should carry.\* For present purposes the following special aptitudes may be distinguished without entering into a theoretical discussion of their purity or uniqueness.

1. *Verbal*. Ability to define, understand, and use words as symbols of meaning and experience.
2. *Numerical*. Ability to manipulate (mentally) numbers as symbols of experience or meaning; to solve problems which involve numbers.
3. *Spatial*. Ability to think or solve problems (mentally) involving objects and the geometrical forms which represent actual objects in space.
4. *Memory for detail*.
5. *Drill*. Ease and speed of routine memorizing or learning.
6. *Physical ability*. Coordination of large and small muscles; speedy and precise manipulation of objects.
7. *Musical*. Appreciation of musical forms and skill in musical performance.
8. *Artistic*. Conception of form, balance, color harmony, and their use in creative endeavors.
9. *Social*. Ability to work with people without friction; leadership.<sup>8</sup>

A somewhat different list of primary mental "factors" has been proposed by Thurstone on the basis of a factor analysis of fifty-six paper-and-pencil tests given to 240 University of Chicago students. This analysis reveals a list of primary factors that are somewhat less inclusive than the list just given, partly because the kind of behavior sampled was restricted by the conditions of testing. Thurstone's list, on the other hand, has the advantage of being empirically determined, whereas the list above is largely the product of shrewd observation. Thurstone proposed that only nine abilities or factors are called for in the performance of all fifty-six tests. Any one test may be highly "saturated" with only one or two factors. Thurstone's nine primary factors are: spatial, perceptual, numerical, verbal, memorial, and others which he calls a "word factor," an inductive factor, a deductive factor, and a reasoning or problem-solving factor.<sup>9</sup> The student may judge for himself which list of special aptitudes is more inclusive of the total range of human activity.

It is beyond the scope of this chapter to discuss each of these capacities separately. For some, special tests are available making it

\*There is, moreover, some question as to whether we are justified in making as clear a distinction between general intelligence and special abilities as we have here proposed. However, for practical purposes we may sidestep the theoretical issues involved, concentrating on the commonsense distinction between general and special abilities.



possible for a person to compare his own achievements with those of persons with comparable training.

An example of a test of special aptitudes is the Seashore Musical Aptitude Test which is really not a single test but a battery of tests. The battery is designed to test sense of pitch, sense of tonal intensity, sense of musical timing, sense of consonance, tonal memory, acuity of hearing, auditory imagery, motility, rhythmic action, voice control, voice register, singing interval, and singing key. Several of these tests have been made into phonograph records suitable for group administration. Used in connection with school surveys, they have been helpful in identifying those with unsuspected musical potentialities and in discovering those with deficiencies that would handicap a musical career. Some conservatories have used the tests as aids in selecting applicants for admission.

It may be well to recall the distinction previously made between trade and aptitude tests (see *Employment Psychology*, page 175). Trade tests are those designed to measure an individual's *present level of skill in, or knowledge of, a given occupation*. Some of these are paper and pencil tests heavily weighted with items testing knowledge of special words used in the trade. For example, a pipefitter might be asked: When connecting a stabilized gas line to a natural gas line, you should use a (1) solid connection; (2) swing joint; (3) separator; (4) emergency by-pass. Other trade tests require the individual to demonstrate his skill. A carpenter might be required to make a specified joint from drawings and materials supplied him. Such tests are principally tools for the employment specialist rather than the vocational counselor. The aptitude tests, on the other hand, are more indicative of what the individual *will probably accomplish* if given satisfactory training.

In addition to the Seashore Musical Aptitude Battery may be mentioned another example of the same sort of test on which considerable information is available. The Aptitude Tests for Medical Students has been in the process of development for some years. New forms are prepared annually to avoid coaching for particular questions and are administered in nearly six hundred colleges giving premedical courses. In some instances the results are used as an aid in selecting candidates for medical schools. The sub-

tests bear the following titles: Comprehension and Retention, Visual Memory, Memory for Content, Logical Reasoning, Scientific Vocabulary, and Understanding of Printed Material. The results bear a significant relationship not only to success in medical school but to ratings of ability as internes five years after the test has been administered.<sup>10</sup>

### *Are Aptitude Tests Really Achievement Tests?*

The critical reader may object that aptitude tests are measures dependent upon training and are, therefore, not distinct from achievement tests. It is true that devices for forecasting one's success in a given profession such as medicine or music include a great many items for which a testee can be coached. However, the test items are selected in such a way that they ordinarily do not call for specific information. The assumption is made in aptitude tests that persons having approximately the same experiences, yet showing important differences in their accomplishments, must differ in aptitude. Moreover, if one individual has profited more than another from approximately the same training, there is justification to assume that the first individual will, in all likelihood, profit more in the future. Consequently, it is possible to use an individual's present accomplishments to forecast his probable future accomplishments.

It is, of course, necessary in interpreting aptitude-test results to know whether the individual has received training comparable to those persons on whom the test was standardized. For example, the Aptitude Tests for Medical Students give a score which indicates how the individual compares with other students who have had only premedical training. It would be unfair to apply this test to entering freshmen or to second-year medical students since their training differs widely from the standard group. Some aptitude tests like the O'Connor Finger and Tweezer Dexterity tests appear to be unusually free of effects coming from long periods of experience and practice in jobs calling for high levels of dexterity. Although novices rarely achieve high scores on these tests, eight out of two thousand inexperienced applicants for a factory job calling for the assembly of fine instruments, gained as high scores as the best skilled woman who had spent five years on the job.<sup>11</sup>

Similarly, scores made on other mechanical aptitude tests of a more comprehensive nature have not increased significantly after six weeks of intensive training in mechanical courses even when the similarity between the test and training activities is marked.<sup>12</sup> It is necessary to know in interpreting aptitude test scores whether special practice does influence the test performance.

Unfortunately, the number of satisfactory aptitude tests is rather limited. This condition is due in part to the difficulty in constructing such tests. Furthermore, many of the people interested in the construction of aptitude tests have been recently concerned with discovering the "prime factors" or the basic aptitudes of man. The lists of such special aptitudes given at the beginning of this section only suggest the kind of subject matter now labeled special aptitudes. Once the minimum number of unique aptitudes is discovered and each is defined, then the test constructors can go about the task of building tests for these basic aptitudes.

However, regardless of the future status of this problem, it is quite evident that some knowledge of one's aptitudes can be of considerable help in making a vocational selection.

## 5. PERSONALITY AND VOCATIONS

Nearly everyone who has dealt with the question of vocational guidance mentions the importance of selecting an occupation into which one's personality will readily fit. The chief difficulty with this advice is that very little is known about the kinds of personalities required in various occupations. There have been very few systematic studies designed to distinguish between salesmen, foremen, business executives, bankers, physicians, and so on, in terms of emotional stability, introversion, dominance, or any other personality feature. This does not mean that vocational counselors have not considered personality important. On the contrary, they talk long and glibly about personality requirements for specific vocations, but they have depended largely upon the evidence from casual observations in arriving at conclusions about the kind of personality required in any given occupation. A good shop foreman probably should be aggressive, dominant, yet sympathetic and sincere. He must be able to give orders without giving offense.

A clergyman many believe ought to be on the introverted, studious side, genuinely sympathetic with the problems and difficulties of others. He should probably be a little less emotionally stable than the general population so that he may more readily sensitize others to the social and spiritual ills of his community. Our knowledge of the kinds of personalities needed in various occupations is mostly speculation.

Are successful ministers as they have just been described? Do foremen possess the characteristics generally ascribed to them? Are successful salesmen socially dominant individuals? What are the personality characteristics of good teachers? Are they different from school superintendents? Only a few studies suggest answers to these questions.

In the chapter on Employment Psychology this problem was considered from a somewhat different angle. At that time both the Humm-Wadsworth and the Bernreuter Scales were briefly mentioned and described. It will be recalled that the construction of personality scales has been difficult because (*a*) the descriptive terms employed are poorly defined and overlapping; (*b*) the features to be measured are themselves variable making it difficult to determine a given instrument's reliability; and (*c*) the responses are a function of the individual's integrity in describing himself. These same difficulties arise when dealing with personality scales for purposes of guidance.

Personality scales in vocational guidance cannot be used with confidence until more is known about the kinds of personality actually required in the various occupations and professions. Again, a consideration of personality factors can lead to important negative but rarely to positive recommendations. A person lacking in patience, with a dislike for children, who shies away from occasions where he may be the center of attention, would probably be unsuited for secondary-school teaching. Or the individual who is blunt, unimaginative, yet dominant and aggressive could be advised to avoid occupations that would call for frequent and important personal contacts. Beyond recommendations of this sort little can be said that is rooted in controlled studies of personality and vocational adjustments.

## 6. SOME AIDS TO SELF-GUIDANCE

*Occupational Orientation Inquiry*<sup>13</sup>

Throughout this chapter the importance of gaining information about oneself has been emphasized. The Occupational Orientation Inquiry is merely a device for systematically evaluating one's knowledge, interest, ability, and placement opportunities in a carefully compiled list of 224 occupations. These occupations range from those requiring no special training to fields necessitating postcollegiate technical specialization. The directions given the individual using this Inquiry are as follows:

All of us know that many times vocational choices are based on inadequate reasons. Perhaps there is a passing interest in that field or there may be a very good friend in that occupation. However, in choosing an occupation one should carefully analyze all aspects of the work in any job which he might care to choose as his life career. Hence you are now asked to consider the occupations listed below from four important standpoints. Look the list over carefully, and, by means of the scales below, rate yourself in each occupation as to your *knowledge*, *interest*, *ability*, and your probable *opportunity for placement* in each field.

A numerical system of rating is used as indicated by the statements which follow:

*Knowledge*

4. I have been regularly employed in the job.
  3. I worked part time or helped in the job.
  2. I have general knowledge of job but no knowledge of details.
  1. I have less than average knowledge of the job.
- If you have no acquaintance with the job, leave the space blank.

*Interest*

4. I think I would enjoy it as a life work.
  3. I think I could develop sufficient interest to enjoy it.
  2. I am indifferent but would work at it if there were the chance.
  1. I would work at it only as a last resort.
- If you would not work at it under any conditions leave the space blank.

*Ability*

4. I think I could have exceptional ability in the field.
  3. I could be successful in the job.
  2. I would be able to do average work.
  1. I would find it difficult to work in this field.
- If you would find it practically impossible to make a living at it, leave the space blank.

*Opportunity for placement*

4. I am practically assured a job.
  3. I have contact with the field.
  2. I know people in the field through whom I might gain contact with the job.
  1. I have no existing contacts in the job.
- If you have almost no possibility of contact in the job, leave the space blank.

One of the chief values in the use of the blank is in getting advisees thinking in realistic terms about themselves. It serves to focus attention on some of the important determiners of vocational success. At the same time, it often throws into sharp relief those occupations in which all four factors rate high. Coupled with the friendly counsel of someone skilled in vocational guidance, it has been helpful in narrowing the field of possible choices.

One college student who had given some thought to his vocational choice prior to filling out the occupational inquiry, wrote the following résumé after examining his self-evaluation:

I find that I rated myself highest as Engineer, Draftsman, Carpenter, and Building Contractor. Others seem to appeal to me as far as interest is concerned, but I have no ability or experience in these.

As far as ability to finance engineering course, I feel that that is assured. Also, that I can handle the technical part of the job. As far as health and physical requirements of the job go, I can fulfill them.

My advice to myself is: Engineering is O.K. My best plan is to take a general course and explore as many types of engineering as possible in the hope of finding something I'm extremely interested in.<sup>14</sup>

Any device which enables a student to guide himself as suggested in the above quotation is well worth while.

*The Test Profile*

Somewhat similar to the Occupational Orientation Inquiry is the test profile or "occupational-ability pattern" as it is sometimes called. This is merely a graphic device for picturing the objective results obtained from whatever tests or measures of achievement are available on a given individual. Sometimes the necessary basic information on which the profile depends can be obtained from the school's cumulative records on which are collected all pertinent test scores and grades. When these are reduced to a common basis (percentile or sigma scores) and plotted as shown in the

following figure, it becomes possible to see at a glance the strong and weak points of the individual.

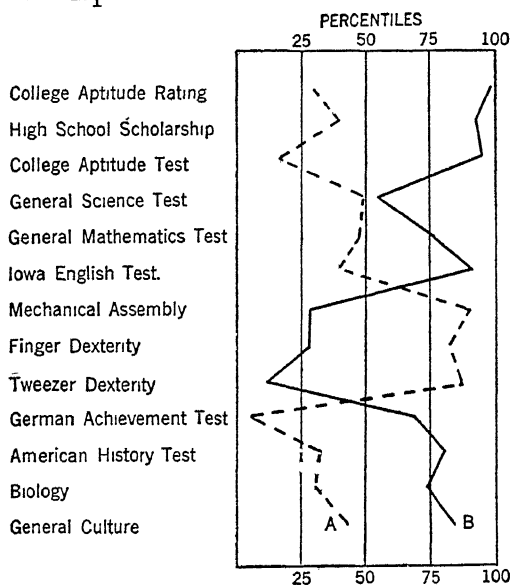


Figure 43. Showing Profiles of Two Boys. Boy A has superior mechanical ability, while boy B is superior academically.

This figure shows two quite different profiles. One boy obviously rates very high in those functions called for in academic pursuits while the other in contrast shows his superiority in mechanical tasks.

It should not be supposed that the test profile is limited only to those items given in Fig. 43. On the contrary, a profile may contain any number of items so long as the quantitative features can be reduced to a common scale. One vocational-guidance center has

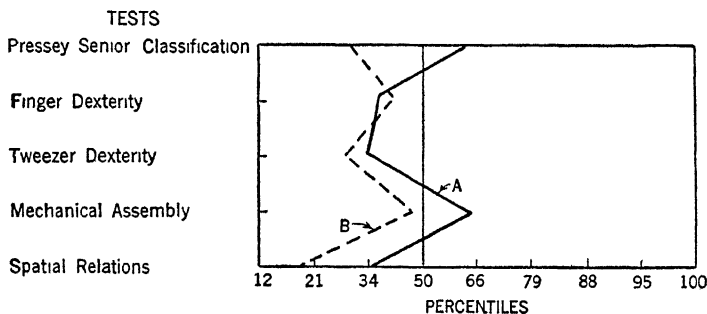


Figure 44. Showing Differences in Test Profiles Between Groups of Good and Poor School Janitors. From B. J. Dvorak, "Differential Occupational Ability Patterns," *Bull. Employ. Stabilization, Res. Instit.*, Univ. Minn. 1935, 3, 22.

specialized in making profiles such as given in Fig. 44 showing the average test performance of two groups of public-school janitors. Previous to testing they had been selected according to their work efficiency, Group A being superior to Group B. The shape of the profiles for each is quite constant, differing principally in the general level of performance throughout all the tests.

The same center has made extensive surveys of several occupational groups, using profiles to show graphically the unique ability patterns characterizing each occupation. Two examples are given below of the striking differences, first, between garage mechanics and men office workers, and second, between two groups which one might expect to be very much alike: retail saleswomen and women office clerks.

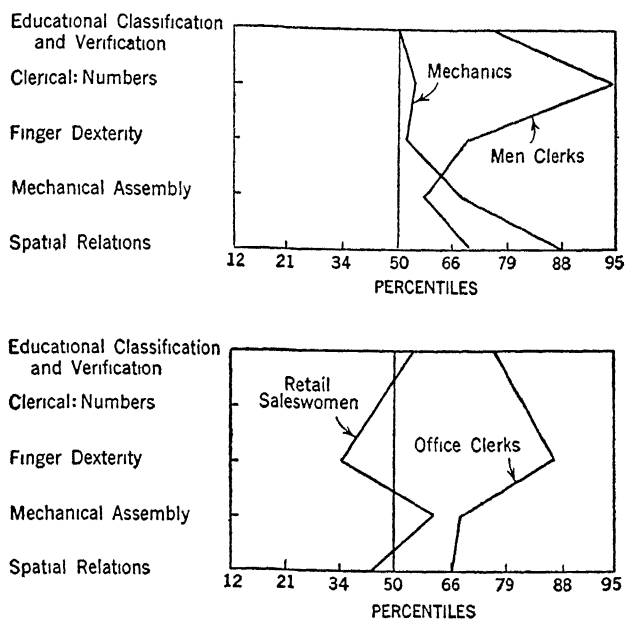


Figure 45. Showing Differences in Test Profiles According to Occupation. From D. G. Paterson, J. G. Darley & R. M. Elliott, *Men, Women & Jobs*, Univ. Minn. Press, 1936, 44f.

Sufficient research work has not been done as yet on profiles to enable the advisee to take a battery of tests and compare his profile with more than perhaps twenty-five well-established typical



patterns as illustrated above. The chief service of the test profile at present is to picture the salient strong and weak aspects of the individual. A young person unaccustomed to assimilating a large number of test results is aided by the profile to see himself as the mental tester sees him. In this way a heterogeneous collection of test results becomes more meaningful and thus more useful in self-guidance.

## 7. OF WHAT VALUE IS VOCATIONAL GUIDANCE?

One may justly inquire, how good is the advice given by vocational counselors? The question merits an answer if for no other reason than to evaluate the time and money annually spent in the public schools and in private consultation to this end. Is vocational guidance just an educational frill without substance or benefit? A summary of all efforts to evaluate vocational-guidance programs in the years 1932-1937 culminated in the conclusion that the evidence was "pitifully insignificant when compared with the momentous aims of vocational guidance."<sup>15</sup> The reasons, however, for this state of affairs are quite understandable.

First of all, vocational-guidance procedures have a very short history and the long-term effects have only recently begun to reveal themselves. Guidance programs must ultimately be weighed in terms of vocational adjustment, which many believe cannot be adequately judged for at least ten years after ceasing one's formal education. Sufficient time alone has prevented satisfactory study of the results of vocational guidance.

Second, the usual criteria of occupational success are open to a number of defects. For instance, "output" as a measure of occupational success is valid only when subjects are in similar occupations, working under similar conditions of wages and hours. "Average number of jobs held" is of questionable value since one post may be preparation for another. On the other hand, the owner of a prosperous enterprise may have made great advancement without ever changing his job. "Annual salary" can only be a measure of success within a given occupation. A very successful minister would hardly receive the salary of an equally successful lawyer, judged in terms of their relative standings in their respective occupations. "Employer's reports" are likewise invalidated because employers lack a common ground of comparison. Finally, "satis-

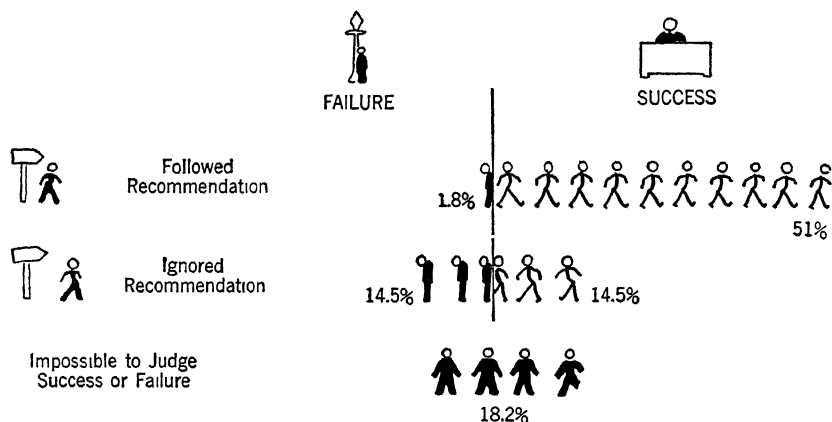
faction" is more often interpreted as meaning satisfaction with the firm, foreman, or compensation than the type of work.<sup>16</sup> A satisfactory criterion of occupational success is, therefore, difficult to obtain.

Third, the easy mobility of the population, in the United States especially, has complicated the task of keeping track of advisees for ten or more years following the period when vocational guidance was given. Serious sampling errors are likely to be introduced unless special efforts are made to keep in touch with upward of 90 per cent of the advisees. A questionnaire study of 327 college alumni graduating in 1936 showed only 0.5 per cent of the first 184 returns were unemployed three years after graduation. The next 125 replies obtained after special effort showed 5.6 unemployed.<sup>17</sup> The difference in these two sets of data from the same college class illustrates the kind of errors that might be made in drawing conclusions from incomplete data on advisees going through a vocational-guidance program. Apparently there is a tendency for those who are making out well to respond more readily to follow-up questionnaires than those who are on relief or unemployed.

In spite of these difficulties in the interpretation of data, a number of studies have given encouraging results. A follow-up of 81 out of 125 advisees 2 to 5 years after they had been given a battery of tests and were individually interviewed, attempted to classify those who were "satisfactorily placed," "unsatisfactorily placed," or "undetermined." Some of the advisees entered vocations and others were given advice as to their educational progress. The accuracy of the vocational recommendations is indicated in the figure on page 504.

If one considers the accuracy of both the *educational* and the *vocational* predictions this study shows 75 per cent were correct, 11.2 per cent were wrong, and in 3.8 per cent of the cases conclusions as to the success or failure could not be determined.<sup>18</sup>

One of the most extensive follow-up studies concerned 639 of 1310 young people who were questioned five or more years after receiving vocational guidance in England's National Institute of Industrial Psychology. The successful adjustments in this group were fifteen times as frequent as the failures when the Institute's recommendations were followed and only twice as frequent when



Each figure represents five per cent

Figure 46. Showing Accuracy of Vocational Predictions.

the recommendations were rejected. Furthermore, 79 per cent of these who had finished their formal education and were working were rated as successfully adjusted to their work.<sup>19</sup> These data speak for themselves. One's chances of success are definitely enhanced by following the guidance of the Institute.

Thorndike and his colleagues have been responsible for a somewhat similar, though much more elaborate follow-up of 2225 New York City school children tested in 1921-1922, their ages varying from thirteen to fifteen years. Eight years later, 1807 were located and questioned about the kind of work they were doing, their wages, and job satisfaction. Correlations were computed between various measures available on the subjects at the beginning of the study with their subsequent achievement. In general, the statistical picture thus presented was far from favorable. In the table below are presented some of the results of this study.<sup>20</sup>

Table 21

Correlation Between:	Coefficient (Pearson $r$ )
Earnings of clerks at 20 to 22 yr. and clerical intelligence test	.26
Earnings of mechanical workers at 20 to 22 yr. and mechanical adroitness test	.10
Interest of clerks in work at 20 to 22 yr. and score on clerical test	.10
Interest of mechanical workers at 20 to 22 yr. and mechanical adroitness test	-.07

The correlations were of such a low order throughout this study as to lead the author to say:

No combination of facts gathered by us at age 14 would have enabled a vocational counselor to foretell how well a boy or girl would do in mechanical work six or eight years later or how happy he would be at it. . . . The judgments of the counselor would have had about 98 per cent as much error as if he had made them by pure guess.<sup>21</sup>

In spite of this pessimistic conclusion, had Thorndike and his colleagues been content to predict merely those who would adjust to their work satisfactorily, the findings would have compared favorably with those of the English survey mentioned above. Another factor of possible significance in interpreting Thorndike's study is the advice given the school children at the time of testing or when they left school. There is no indication from the report of anything approaching the kind of carefully considered recommendations that were given the children going through the National Institute's vocational guidance program in England. As previously emphasized, vocational guidance is much more than the process of giving and scoring tests. Consequently, it is manifestly unfair to judge the efficiency of guidance by a set of correlation coefficients between test scores and accomplishment. The important contribution of sympathetic intelligent advice is wholly ignored by such an evaluation procedure.

These three studies are not necessarily typical of all the investigations concerned with this problem. However, they do suggest that the practices and procedures commonly used by reputable counselors are superior to an unsystematic search for any job that will provide a livelihood. Before one can be positive of this conclusion it will be necessary to study a representative cross section of the population, rate their occupational success in terms of some satisfactory criterion, and then unearth the kind and amount of vocational guidance they received prior to their employment. No such study has yet been reported. The investigations that start with a list of previous advisees are all open to the objection that the group is selected from the outset. It may be that the persons who seek vocational guidance are least in need of such advice but are merely interested in obtaining some confirmation of the de-

cision which they have already made after careful, self-initiated thought. This is, of course, only a hypothesis which ought to be subjected to investigation since it has an important bearing on all studies designed to evaluate vocational-guidance procedures.

## 8. SUMMARY

This chapter has emphasized throughout the importance of self-knowledge and self-guidance in the light of all the information that one can obtain through consultation and the measurement of abilities, accomplishments, interests, and personality traits. While it is unquestionably desirable and prudent to give thoughtful consideration to the choice of one's vocation, this concern can be tempered somewhat by the knowledge that most people can succeed in more than one field. Most college students, certainly, will do well, at least in the early stages of their vocational preparation, to avoid undue specialization, keeping in mind the possibility of shifting to a related field should conditions demand such a change. Intelligence has been related to the occupational picture, calling attention not only to the minimum requirements but to the maximum limits imposed by some occupations. The instruments used in evaluating interests were mentioned along with the problems of interpreting the resulting scores. Aptitude tests have been surveyed from the standpoint of their essential meaning and the basic assumptions underlying their construction and use. The discussion of personality was limited by the poverty of definitive studies showing exactly what kinds of personality are most successful in given occupations. Two aids to self-guidance, the Occupational Orientation Inquiry and the test profile, have been presented. Finally, representative studies of the value of vocational guidance showed that in spite of some difficulty in obtaining satisfactory criteria there is reason to believe that the tested procedures discussed in this chapter, crude as they are, are better than picking an occupation without their aid.

## Chapter 19

### EFFECTIVE SPEAKING AND WRITING

What makes for effective speaking and writing? What features distinguish the mediocre from the brilliant writer; the uninteresting from the persuasive speaker? A great many books have been written to answer these and related questions, but for the most part they have approached the problems from the literary rather than the psychological point of view. Knowledge of grammar, literary form, and the principles of composition are indispensable, but they are not enough if one is to attain average or better than average success either on the public platform or through the printing press. In the final analysis, effective speaking or writing is judged in terms of its effect on other people. Viewed from this angle the problem falls within the province of psychology.

Written and spoken communication is a necessity of modern civilization. The shop foreman must, through his orders and directions, maintain high morale and high production. The business executive must control his organization through persuasive speeches and clear memoranda. The politician must garner his votes and mold public opinion by means of his printed articles and radio speeches. Even the scientist must report experiments in concise, clear language which is understandable to others. This does not imply that glib talking or flashy writing are substitutes for honest achievement. The "front" is not at all important. But the man unskilled in speaking or writing is less likely to attain his goals than one with equally good ideas plus an ability to express himself effectively.

There is a growing conviction that unclear writing is evidence of unclear, muddled thinking. Some scholars have excused their obscure utterances by assuring their public that the underlying ideas are more important; that the verbal forms in which the ideas

are wrapped are merely superficial. In some cases this probably represents a rationalization for the author's unwillingness to master the techniques of effective communication. On the other hand, a great many scientists and philosophers have testified that the effort to set down in writing their nebulous ideas has clarified their own thinking. Ideas are largely, if not completely, verbal in form. Vague, ill-defined concepts are expressible only in vague, obscure language. Lucid thinking finds expression in lucid speaking and writing.

The features found in both good writing and good speaking are much the same as those found in a good advertisement. Speakers or writers, aside from those whose aim is merely to entertain, are basically concerned with "selling" an idea. They usually aim at convincing an audience of the truth of some proposition conveying the author's feelings and emotions. Like advertisers, they must transmit their message to others. Accordingly, psychological analysis of good writing or speaking reveals that it must *attract attention, hold interest, and convince the audience*.<sup>1\*</sup>

This chapter will discuss some of the techniques helpful in attaining these ends. For the most part it will be limited to a general treatment of principles and procedures without emphasizing the special application in dramatic writing, radio presentations, poetry, and fiction.

## 1. ATTRACTING ATTENTION

Regardless of whether one is writing or speaking, he must first attract attention if his message is to reach the audience. Too often learned men with provocative ideas fail to gain the credit due them partly because their writing and speaking proceeds without ever beginning. They assume their audience is as interested as they are in the subject at hand. They seem to forget that the interest pattern of each individual is unique. A common thread running through each of these unique patterns must be pulled to galvanize attention. The fiction writer must, in his opening lines, rough out a picture that is compelling. The speaker, if he is to succeed, must say or do something that snaps the attention of his listeners from

\*At this point the term "audience" is used to include both readers and listeners.

their numerous foci to himself. One must attract attention before he can convince and move his readers or listeners.

The diversity of attention-getting "first lines" in stories taken from a single issue of the *Saturday Evening Post* was revealed by one illuminating study.<sup>2</sup> The reader may judge for himself which of the opening lines is most effective in catching attention. Which is most interesting; which rates second place? Finally, which arouses the least interest?

First sentence of Story A.

For Charles Edward the twenty-ninth of May was a great day, not because it was the anniversary of the fortunate elusiveness of Charles II, but because on that day Alexander the Great, a popular London tailor, was sending him a new suit.

First sentence of Story B.

Shuffling, tapping with his blood-stained gaff, the blinded Newfoundland seal-hunter at dawn adventured his derelict way across the vastly swinging floes.

First sentence of Story C.

Mr. Arthur Embury Thompson stood before the mirror and cerebrated violently.

First sentence of Story D.

The atmosphere of the small living room had grown tense with the watchful waiting of its three silent occupants.

First sentence of Story E.

Press cupboards, livery cupboards, court cupboards, and chests of frame! All these four forms of practically the same thing were pouring through Francis James' mind.

The reader's judgments maybe compared with the opinion derived from seventy students who were presented with the same lines.

Order of Merit

Story A	2
Story B	4
Story C	3
Story D	1
Story E	5



If sentences D and E are compared there may be found some hint as to one of the principles that helps in attracting attention. D leads into the story directly and excites a feeling of mystery and tension. The picture is clear, if incomplete. On the other hand, the disjointed, vague picture of confusion suggested by E strikes at no widespread interest, and by reason of its vagueness leaves the reader quite free to turn elsewhere. Attention-getting openings are usually vivid, clear-cut word pictures that are related to widespread human interests. What are some of the general interests to which a writer can tie his presentation?

### *Attention-getting Techniques for Writers*

*a. Wish Fulfillment.* It is the opinion of some literary critics, based upon their general impressions rather than upon systematic investigation, that much literature is successful because it is related to wishes or interests that are ordinarily unsatisfied. In identifying himself with the hero or heroine the reader experiences vicariously (secondhand) the exhilaration of success ordinarily denied him. Interest in the biographies of great persons is traceable, according to this notion, to the reader's unfulfilled desires to experience the success others achieved. In childish fairytales dream wishes are consummated by magic drinks, wands, lamps, and countless other objects of special virtue. Through them the hero (and the reader) is endowed with power, wisdom, or wealth to conquer obstacles, thereby attaining happiness and contentment. In more adult writing magic is supplanted by clever skill, legal twists, smart repartee. Not all effective writing attracts attention because of its promise to fulfill frustrated desires vicariously. However, wish fulfillment is a prominent feature, particularly in fiction, accounting for much of its attention-getting qualities.

*b. Questions.* An article indicating in its introductory sentences that some important question will be answered, some mystery solved, is likely to excite curiosity and induce the reader to continue. Some of the most prosaic materials can be livened if cast in the form of simple questions and answers. Thus the W.P.A. informs taxpayers of its functions and operations by means of a pamphlet starting with a number of questions such as: What is the W.P.A.? Does the W.P.A. give relief without work? What is

a W.P.A. project? Are W.P.A. projects planned locally or federally? Immediately reader interest is caught, curiosity aroused.

Consider the following example:

A stranger at the flower show can understand why people gather in spellbound masses to gaze at a gold-medal garden, dazzling with exotic azaleas and out-size tulips of great price. But why, he asks, should a similarly rapt and adoring crowd bank up before a lighted wall niche containing nothing but a dime's worth of daffodils and a couple of sprays of forsythia in a blue dish? Why all the excitement over a mere bouquet?<sup>3</sup>

Or this one:

Can a democracy fight a total war and still remain a democracy?<sup>4</sup>

In each case the writer could, if he wished, give at the outset the answer to his question. Instead he teases, holds a choice morsel in reserve, and leads the reader into the article.

*c. Newness.* Western civilization puts a premium on new things. People are curious about the new model automobiles, the latest fashions in clothes, the newest discoveries of science. Even a personality sketch of a man can be pegged on the appeal to interest in the new, as the following example testifies.

The Library of Congress has a new librarian, a new building, and a new librarian emeritus.<sup>5</sup>

Closely related, to, if not actually a part of this widespread interest in the new, is interest in the future. Some newspaper columnists gain a wide following because of their "predictions of things to come."

*d. Novelty.* By novelty in an opening is meant the combination of ideas or scenes which might in isolation be quite commonplace but when combined yield a picture that is either arresting or startling. The personality sketch of a twenty-year-old exhibition parachute jumper opened by calling attention to his other jobs as a school janitor and special policeman. Other examples of novelty are found in the curious combination of pictures aroused by the following:

It is a long mush from Manitoba to Greenwich Village by way of the Arctic, and as Vilhjalmur Stefansson sat in his book-filled apartment

on Morton Street the other day describing the journey, he recounted anecdotes which filled three-score years.<sup>6</sup>

"Pigeons," said the major, "can win battles."<sup>7</sup>

This last quotation not only attracts attention because of its novel combination of ideas but also because of the apparent exaggeration which is partly dispelled in the next few lines.

One danger besetting the author who strives for novelty is that his attempts may become grotesque rather than pleasantly interesting. The line between the two is indistinct. No concise suggestions can be made to avoid grotesqueness other than to observe that interesting combinations are those which fall together effortlessly without straining the reader's credulity.

Nixon has suggested the following lists to illustrate interesting and less interesting word combinations.<sup>8</sup> Which of these are grotesque and which pleasantly attractive?

<i>Interesting Pairs</i>		<i>Less Interesting Pairs</i>	
Rain	Fishbones	Rain	Water
Frogs	Whiskers	Frogs	Toads
Flexible	Bone	Flexible	Wire
Necktie	Noose	Necktie	Collar
Prince	Pauper	Prince	King
Elephant	Tonsil	Elephant	Trunk
Boston	Mars	Boston	New York
Rubber	Oyster	Rubber	Doll

e. *The Inside-story Approach*. The great group of American "debunkers" of a few years ago gained the spotlight of attention by taking the reader behind the scenes, on confidential tours of inspection, to get the inside story. It is a technique that has all the elements of the back-fence gossip column raised to a higher degree of respectability. There is a tone of mystery about the approach. Here is one of the best known debunkers at work:

The fact that all the polls run heavily against American participation in the threatening European war is not to be taken seriously.<sup>9</sup>

Here is another author just bursting to tell the country a real tale of great importance. Notice how he uses a single phrase to suggest both its importance and its secret nature.

I hope the story I am about to tell will be investigated by a Congressional Committee. Among other things it relates to the diversion of public funds for purposes unauthorized by Congress. Similar activities have merited the term "graft."<sup>10</sup>

f. *The How-to-do-it Approach.* Writing which promises to help the individual to improve himself is likely to gain a wide audience. Most of the reading public appear to be interested in gaining some new skill that will help either in entertaining their friends or in advancing themselves in their occupation. The best seller, *How To Win Friends and Influence People*, is an example of this approach. Whatever interest has developed in this present chapter is probably the result of some desire on the part of the reader to improve his skill in writing and speaking.

g. *Driving to the Point* In addition to the techniques just outlined, every bit of writing that must gain reader attention on its own merits should drive immediately to the point. This feature is best exemplified in news stories where the important facts are tersely told in the opening words: "Lindbergh did it! Twenty minutes after 10 o'clock tonight suddenly and softly there slipped out of the darkness a gray-white airplane as 25,000 pairs of eyes strained towards it. At 10:24 the Spirit of St. Louis landed."

Other types of writing demand something of this same directness. Re-reading the examples given in the last few pages will show how each opening not only arouses interest but gives more than a broad hint of the essential content of the article. The theme of the piece is established either in the opening sentence or in the first paragraph. In short story writing a scene, something of the characters, and the main conflict are quickly sketched in the opening sentences. Later the reader is led back in time to an earlier point where the plot actually begins.

The importance of driving to the point early in one's presentation was revealed by a study of the memory value of several different modes of emphasis available especially to the public speaker. (While this study used oral representation, the principal finding is probably applicable to writing as well.) The investigator prepared a short biography of a fictitious person which he presented to ten different groups of college students, each time varying the method of emphasizing certain statements. On some occasions he

repeated statements; on others he used verbal emphasis (the phrase, "Now get this.'). In addition, he employed other devices which will be considered later. The results showed that statements made at the beginning were remembered 75 per cent better than unemphasized statements in the middle of the speech.<sup>11</sup>

The significance of this fact particularly for the public speaker is obvious. If he is sure of the good will of his audience he can safely present the salient feature of his address at the start, with very good reason to expect it will impress his listeners. It is certainly true, also, of good writing that the opening lines must not only compel attention but must, in addition, provide a peg on which the subsequent story is hung.

### *Attention-getting Techniques for Speakers*

Over and above the techniques that apply particularly to written communication, a number of special devices are available to the speaker, aiding him to polarize his listeners' attention on the subject at hand. The reader will observe that effective speakers, as well as effective writers, employ one or more of the procedures just outlined in the previous section. The speaker, however, has a number of advantages over the writer in gaining attention. For one thing, the audience has evidenced its interest by the simple act of gathering. This natural advantage is often erroneously accepted by a speaker as reason enough for neglecting attention-getting devices at the beginning of his speech. However it will be well to examine some of the special attention-getting devices available to the public speaker.

*a. Chairman's Introduction.* From the psychological point of view, the chairman's task is to start the process of polarizing attention. Usually he can accomplish his end by building up the prestige of the speaker or the importance of his subject. Occasionally, the chairman may carry his task to an extreme, forgetting that he is not the principal speaker. Long oratorical introductions defeat their purpose and bore rather than polarize the audience. In such cases the speaker starts under a handicap and must reestablish attention to the platform. The chairman should keep uppermost in his mind that he must help the speaker to unify the audience and direct attention to the topic at hand.

*b. Voice Quality.* A great deal has been written in public-speaking textbooks about pleasant and unpleasant voice qualities. The common unpleasant qualities are nasality, hollowness, hardness, breathiness, throatiness, and thinness. Exercises beyond the scope of this book have been proposed to correct these deficiencies, but there is little indication of the effectiveness of these exercises in correcting the difficulties they are designed to cure. Indeed, a recent research report suggests that little progress may be expected in improving voice quality unless there is some effort to correct certain personality deficiencies. A survey of 119 students with unpleasant voice qualities showed that those with breathy voices rated high in neurotic tendencies and introversion and were low in dominance. At the same time, students with either nasal or breathy voices rated themselves lower in speech personality than did disinterested critics. On the other hand, students with harsh, metallic voices tended to rate themselves higher than the critics.<sup>12</sup> As this report suggests, the unpleasant quality of one's voice may not be so much a matter of the mechanics of vocalization but may rather be related to some personality twist requiring prior treatment.

Apart from the problem of correcting unpleasant voice qualities, there is no doubt that a pleasing voice is a powerful asset both in attracting and holding attention. This is particularly true in radio speaking, where many of the attention-catching devices of the platform are absent. Milton Cross says, "An announcer's voice must be healthy, well-dressed, and cheerful," a description that is no less applicable to the platform speaker. It is possible that the very close victory of Roosevelt over Willkie in 1940 was partly due to the unquestioned superior radio voice of the President.

In those few moments when a speaker utters his first words to the audience, his voice is judged. If it is unpleasant the task of holding attention and, later, of convincing his listeners, is rendered more difficult. It is not unreasonable to suppose that there were in the days of Gladstone, Clay, Webster, William Jennings Bryan, and La Follette, Sr., men of equal rhetorical eloquence who failed to gain eminence simply because their voices, not their words, were unpleasant. It is known that a great many motion-picture stars rapidly lost favor when sound pictures displaced the

silent movies. Stars with good acting ability but poor voices became box-office failures.

c. *Mechanical Devices and Unusual Acts*. Unusual circumstances sometimes call for unusual techniques for attracting attention. William Jennings Bryan is reputed to have gained control of a booing, hostile audience that had been kept waiting for him to speak, by simply striding to the front of the stage and "staring them into profound silence." Bryan merely stood stock still without uttering a word until the audience was ready to listen. Another speaker, the last of a number who had bored the audience, was astonished to see the crowd move from their seats before the chairman could introduce him. Instead of waiting for the chairman, the final speaker jumped to the fore, waving some alfalfa roots that the previous speaker had used to illustrate his talk. In a few well-chosen words while holding aloft the roots, he gained the audience's attention and held it throughout his twenty-minute discussion.

Ordinarily, however, mechanical devices and unusual acts are undignified and unnecessary. They often lead the audience to feel that it has been tricked, with the result that resentment against the speaker develops, making it more difficult to hold attention as the talk proceeds.

## 2. SECURING INTEREST

Stories and speeches that start well sometimes go "soft" in the middle. The author attracts attention by his opening but fails to hold what he has caught. In some respects this second task is more difficult than the first, since perfect sustained attention over an extended period of time is well-nigh impossible. Nearly everyone has noticed that the ticking of a clock in a quiet room fades and then surges in loudness. The amplitude of the sound waves remains the same, and consequently one would expect the loudness to remain constant. Some psychologists have suggested that the fading and surging of the sound is really an indication of rhythmical changes in attention. The same steady conditions of stimulation are, of course, not present in reading, or in listening to a speaker, but there is no doubt that the audience's attention cannot be held unwavering for long. The speaker or writer should aim to construct his presentation so as to permit some relaxation of attention,

and yet stud his material with items that will periodically reattract.

### *Writer's Devices for Holding Attention*

*a. Choice of Words.* The writer of fiction, of poetry, of character sketches, of general informative articles, must direct and excite the imagery of his readers. He must "put pictures in their heads." When the words on paper fail to stir an orderly procession of images they grow dull, lifeless, and uninteresting. If there is any single key to the problem of holding attention, it lies in the choice of image-arousing words. Consider the following selection—the opening paragraph of one chapter in a book dealing with radio advertising:

New York's Fifth Avenue is heralded as an international highway, because in its show windows the merchandise of all America and of foreign lands is on display in an advertising way. There are furs from the Arctic; woolens from England; priceless skins from the jungles of Africa; silks from the Orient; hides from the prairies, and the latest fashions from Paris. On the Avenue can be found the wares from all the continents—from the Old and New Worlds, and even from the depths of the seven seas that give up their glistening pearls and corals for a society damsel's neck.<sup>13</sup>

It might have been written this way:

New York's Fifth Avenue is really an international highway because there is collected for display samples of the world's merchandise. There one may see imported furs, woolens, skins, silks and hides—even pearls and coral.

Notice the difference in imagery which the mere catalog of items arouses in contrast to the pictures created by the original selection. The effective writer uses more frequently words that suggest action rather than mere existence; that describe concisely rather than denote; that are definite rather than abstract.

Effective writers not only use "picture" words but they also frequently employ words that are "emotionally toned." Words that grip the reader and rivet his attention are those which are rich in "affective quality." The following contrasting lists illustrate



the difference between neutral words and those that are emotionally toned.

*Rich in "Affect"*

veer  
contrivance  
timorous  
feign  
explicit  
glorify  
decry

*Deficient in Emotional Tone*

deviate  
device  
awful  
assume  
definite  
praise  
oppose

*b. Sentence Length.* Long involved sentences are the source of much inattention in poor writing and speaking. It is perhaps more important for the speaker than the writer to keep his sentences short. The listening audience cannot easily retrace the author's words and pick up the thread of thought where it was dropped. However, poor writing can often be improved by cutting the length of sentences so that they demand only short periods of sustained attention. The most recent wartime presidents of the United States are contrasting examples of this point. Compare Wilson's style with Roosevelt's. Both are opening lines from their declaration of war messages.

I have sought this opportunity to address you because I thought that I owed it to you, as the council associated with me in the final determination of our international obligations, to disclose to you without reserve, the thought and purpose that have been taking form in my mind in regard to the duty of our Government in these days to come, when it will be necessary to lay afresh and upon a new plan the foundations of peace among nations.

It is inconceivable that the people of the United States should play no part in that great enterprise. To take part in such a service will be the opportunity for which they have sought to prepare themselves by the very principles and purposes of their policy and the approved practices of their government ever since the days when they set up a new nation in the high and honorable hope that it was and did show mankind the way to liberty.<sup>14</sup>

Now listen to Roosevelt:

Yesterday, December 7, 1941—a date which will live in infamy—the United States of America was suddenly and deliberately attacked by naval and air forces of the empire of Japan.

The United States was at peace with that nation and at the solicitation of Japan, was still in conversation with its government and its Emperor looking toward the maintenance of peace in the Pacific.<sup>15</sup>

Wilson's long, complicated sentences call for a degree of concentrated attention that is difficult for most people. Roosevelt, on the other hand, employs in addition to a trained voice and simple, crisp words, a sentence structure that is both easy to read and to understand.

*c. Rhythm in Writing.* It has been assumed that rhythmical poetry or prose is preferred when the cycles of emphasis coincide with the normal fluctuations of attention (see page 516). Although there is no direct evidence supporting this hypothesis, the suggestion has a certain reasonableness to recommend it.<sup>16</sup> In reading the following two selections, notice the jerky hesitation at points in the first and the smooth swing of the second:

It was not until Francis Galton, with his "Hereditary Genius" published in 1869, introduced a method for appraising kin resemblance through the number of highly superior persons who clustered in family lines, that "nature-nurture" investigations began to come from men of science, although the great religions and political states had been built around the idea of men endowed to lead. Galton's study, which showed that men of genius were many times more likely to have geniuses among their close relatives than were men at random, stimulated a legion of followers who compiled studies on the defective end (e.g., the Jukes and Kallikaks), as well as at the upper end of ability.<sup>17</sup>

Here is an example of rhythmical writing at its best:

In every sentence pronounced by a judge in the name of the sovereign people dwells the whole majesty of justice. The august character of that justice was brought home to Jerome Crainquebille, costermonger, when, accused of having insulted a policeman, he appeared in the police court. Having taken his place on the dock, he beheld in the imposing, sombre hall, magistrates, clerks, lawyers in their robes, the usher wearing his chains, gendarmes, and behind a rail the bare heads of the silent spectators. He himself occupied a raised seat, as if some sinister honor were conferred on the accused by his appearance before the magistrate.<sup>18</sup>

Suppose Anatole France had been less gifted and had written the same scene something like this:

The whole of justice dwells in every sentence imposed by judges in the name of the people. Jerome Crainquebille who was a costermonger found that out when he appeared in police court. He was accused of insulting a policeman. After taking his place he saw the magistrates, some clerks and lawyers, the usher with his chains, the gendarmes with their uniforms, and the silent spectators with their bare heads.

It is significant that rhythm in all its forms has been one of the most difficult topics for psychological investigation. Probably it is more art than science. In spite of this limitation, an analysis of good rhythmical writing suggests that it possesses a number of distinctive features. First, the sentences are usually of moderate length—twenty to thirty-five words—with a climax usually near the end. Second, the word sounds fit rather than fight. They are easy to pronounce. Third, both the sentence structure and sentence length are sufficiently varied to avoid the deadening effects of monotony. Finally, “tacked-on phrases” are noticeably absent. For example, the opening sentence of this section originally read, “It has been assumed that rhythmical poetry or prose is preferred when the cycles of emphasis coincide with the normal fluctuations of attention *which we have previously mentioned*.” The last clause adds nothing to the meaning and detracts from the climax.

From the psychological standpoint, rhythm in writing attains its attention-holding advantage because, paradoxically, it allows the reader or listener to relax attention at more or less regular intervals. At the same time, the emphasis is such as to reattract attention before competing stimuli gain an advantage.

### *Humor*

Humor, if judiciously used, is a convenient tool, serving at least two functions in both writing and speaking. When introduced in the middle of a composition it provides a period of relaxation for those whose attention has been held close to the subject. For those whose attention has wandered, the anecdote or humorous turn of speech draws them back.

The dangers in the use of humor are so numerous that it must be used with considerable skill, else it may prove more of a handicap than an aid. It must first of all be relevant to the topic at hand. Second, it must not be carried to the point where the basic ideas of

one's material are obscured. Third, the humor must be humorous to the audience, for few things detract more from a presentation than a joke which misses fire.

### *Climax*

Good writing is good partly because it marches step by step to a climax. This means that the writer must be careful to avoid redundancy of words and ideas, such as, "odorous to the nose." (Could anything be odorous to anything but the nose?) On a larger scale, some authors repeat their basic ideas in somewhat different words, reaching their climax only after leading the reader "round and round the mulberry bush." In addition, many otherwise good authors fail to distinguish the important from the unimportant details of their presentation. As a result, the reader is soon lost in the underbrush and loses sight of the trail marks on the trees. One psychologist writing on techniques for detecting deception soon found himself discussing in detail the psychology of memory, a topic that is only incidentally related to the problem of deception. In consequence, the reader's interest soon flagged and the main topic was only partially understood.

Organization is the key word which describes the process whereby the writer is able to point his material toward a climax. It is not sufficient to marshal a series of facts unless the writer can find some connecting thread tying them together in an orderly array. If magazine articles dealing with a variety of subjects are examined it will be found that the theme is announced in the opening paragraphs. The bulk of the article develops this theme, sometimes winding up with a summary that restates the thread of the discourse.

### *Speakers' Devices for Holding Attention*

Many of the techniques of good writing are also applicable to good speaking, but the speaker has some advantages over the writer which enable him to hold attention.

a. *Gestures and Vocal Emphasis.* An otherwise poor speech can be made better and a good speech can be made effective by intelligent use of gestures and vocal emphasis. This fact was recognized by the pious parson who wrote at one point in the margin of his sermon

notes, "Argument weak: yell." Not only can the speaker emphasize important points by varying the loudness and intensity of his voice, but, in addition, changes in the tempo of his delivery also make for emphasis and attention-getting variety. Effective speakers often employ "pregnant pauses" after important points, particularly when audience attention is at its maximum.

The relative effectiveness of such devices was examined in a study referred to on page 514. The reader will recall that Jersild presented the same material to ten separate groups of college students but changed the modes of emphasis at various points on repeated presentation. Following each presentation the students were tested for their recall of the speech content. In the following table are indicated the relative recall values for material emphasized in each of the ways indicated.

Table 22. Showing How Various Modes of Emphasis  
Affect Recall of Material

<i>Mode of Emphasis</i>	<i>Percentage Score</i>
Five repetitions	315
Four repetitions	246
Three repetitions	197
"Now get this"	191
First statement	175
"Did you notice that?"	154
Pause	143
Last statement	128
Loudness	126
Gesture	118
Bang	115
Middle position, unemphasized	100
Slow speech	79

It is evident that almost any of the variations tested add to the impressiveness of the material. There was some indication from the original data that gestures and banging the table may at times be harmful rather than advantageous especially if the material is not sufficiently momentous to warrant such actions. Moreover, evidence from other studies verifies the memory superiority for repeated statements but goes further to point out that listeners frequently object to repetitions, claiming that they detract from the material's interest.<sup>19</sup> These interpretations of the data suggest

that some care must be exercised in applying the information contained in the above table to practical situations.

The platform speaker who remains stationary and immovable throughout his presentation is tiring to the audience unless the speech itself is unusually interesting. The problem is again one of the inherent limitations of sustained attention. As long as the speaker remains in one spot the audience cannot be expected to look at him continually. Other equally fixed points in the auditorium compete for attention. The speaker might just as well take advantage of the fact that moving objects are attention getting and thereby make himself more interesting than the chairs or ferns on the platform. At the same time, the movements of the speaker need not be so frequent or rapid that they are disconcerting.

This is not the place to discuss the various classes of gestures and precisely the way in which each is used. Some public-speaking textbooks go so far as to catalog arm, hand, head, and trunk movements, discussing with an air of finality the meaning of each. From the psychological standpoint it is of interest merely to observe that gestures which come naturally to a relaxed speaker in command of his subject matter will carry the emphasis intended. Gestures are after all a primitive form of speech. As such they are stamped with much the same individuality that characterizes the voice. It is important, however, to remember that the public speaker can often gain added emphasis if he will unlimber his muscles and use his hands as he would if he were in earnest conversation.

*b. Illustrations, Charts, Slides.* Advertisers have long since recognized the importance of supplementing their written copy with pictures. The same is true of certain classes of fiction and general magazine articles. The public speaker can also enliven his presentation if circumstances are such that he can use illustrations. The possibilities in this direction vary from the use of silent motion pictures to the display of wall charts and blackboard sketches.

There is considerable evidence from psychological investigations that a presentation through two sense avenues is remembered better than a presentation through a single sense. In one experiment three lists of names of common objects were prepared, equal in length. The first list was read to a group of students; the second was presented visually on the blackboard, only one word being

presented at a time; the third list was read and the corresponding objects were displayed. Memory for each of the three lists was tested immediately after the presentations and three days later. The results are summarized in the following figure:

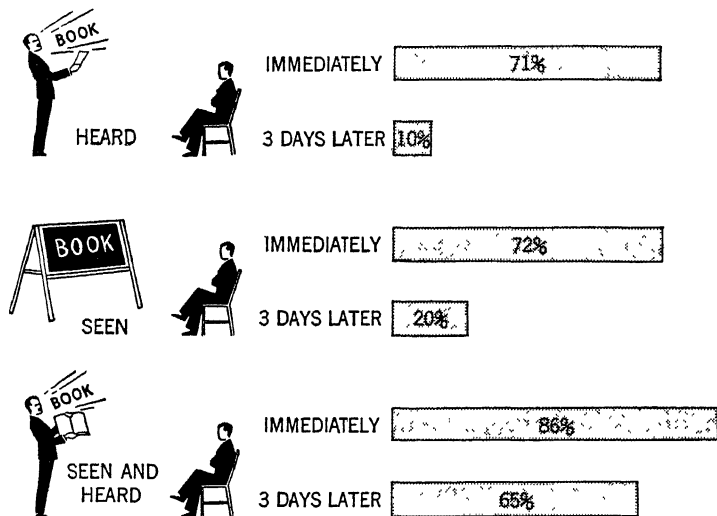


Figure 47. Showing How Method of Presentation Affects the Amount Recalled.

The very slight advantage which the third method has immediately after the presentation is many times greater after a lapse of time.<sup>20</sup>

This study is representative of a great many others which have been summarized by Hollingworth, who concludes that "the evidence is fairly consistent in that the addition of visual materials to the auditory presentation is more favorable for memory than is auditory presentation alone. . . . Moreover, the evidence is unanimous that the visually presented material is considered more interesting than is the material orally presented. It is at least clear that the speaker who fails to take advantage of the interest and memory value of visual aids is ignoring some of the technique of impressiveness."<sup>21</sup>

*c. Establishing Rapport.* *Rapport* refers to the state of confidence existing between the speaker and his audience. Some actresses, speakers and other public performers have often mentioned their experiences in "holding" or "losing" their audience. They are

referring to the state psychologists call "rapport." In essence it is probably nothing more than heightened attention and concentration on what the speaker is doing, but its establishment often depends upon the speaker's adaptability to minor cues from the audience.

The skilled speaker observes his audience carefully for facial expressions and movements that indicate amusement, incredulity, hostility, boredom, or some other attitude, in order to discover whether he is producing the effect intended. What he says and what he does is partly governed by the cues he receives. Unlike the writer, he can modify his presentation, hurrying over this point or dwelling on another, depending on the way the bulk of the audience seems to react. If the speaker respects these signs the audience begins to feel more of a conversational relationship with the speaker, a condition that is conducive to persuasion.

Social facilitation has been mentioned (Chap. II, page 33) as the stimulating effect on an individual produced by other members of his group, all of whom are engaged in essentially the same activity. Such facilitation may develop in an audience and may render the process of establishing rapport somewhat easier. There is some evidence suggesting that persons in the center of the audience are more likely to be in rapport with the speaker than those on the edge of the group. This conclusion was drawn from a study of the grades received by university students in relation to their location in the classroom, those on the outskirts being more likely to receive low grades than those in the center.<sup>22</sup> Presumably, those students who were surrounded with others, more or less attentive to the lecturer, were less likely to be restless and inattentive.

Many people as members of an audience have no doubt experienced some lack of attention when the listeners have been scattered over a large and nearly empty auditorium. The practiced speaker recognizes this possibility and when faced with such a situation may ease the task of establishing rapport through social facilitation by asking the audience to sit close together.

Aside from the scattered seating of the audience there are two principal sources of difficulty in establishing rapport. One is a manuscript which is obviously and unskillfully read. Public-speaking



critics are fairly well agreed that a read manuscript is a handicap in holding audience attention. Indeed, there is some objective evidence of its handicapping effect. One university professor read to one of his classes a statement of about five-minutes duration on the life and scientific achievements of Helmholtz. To another class the identical material was presented as a free utterance. The professor made every effort to keep the same tempo and emphasis in each class. A subsequent test on the content of the five-minute presentation revealed the following results.<sup>23</sup>

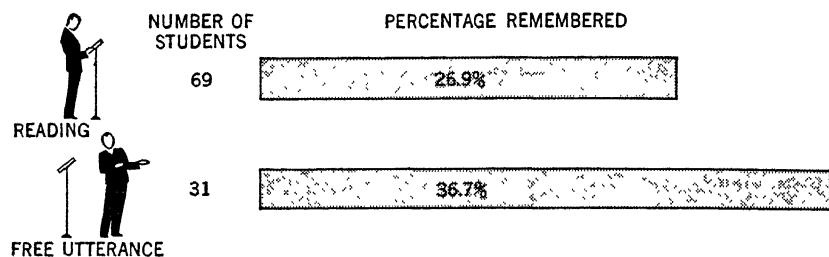


Figure 48. Showing Relative Effectiveness of Reading vs. Free Utterance.

It is possible that the manuscript conveys to the audience the impression that the speaker is little more than a public-address system without personality. Certainly from the speaker's angle constant dependence on the manuscript throughout the speech prevents him from observing audience cues helpful in establishing and maintaining rapport.

A second source of difficulty in regard to good rapport lies in recurrent disturbances that are extraneous to the speech itself. Peculiar mannerisms, frequent and habitual use of "er" or "ah" in pauses, the presence of a large number of intrinsically interesting objects in the room—all of these interfere with the establishment of rapport.

### 3. PERSUADING THE AUDIENCE

The art of persuasion is not simply a matter of logic, important as that may be. A speech or magazine article whose substance is merely a parade of syllogisms would not only be uninteresting but to most people would be unconvincing. The audience might be induced to give passive assent to the author's proposition but most

likely would be quite unmoved. If one is to persuade his audience thoroughly he must appeal to emotions, feelings, and sentiments as well as to intelligence and logic.

The usual audience is capable of some reasoning. The current popularity of forms both on the radio and on the public platform, the prevalence of "pro and con" articles in magazines, are evidence of public interest in argumentation. It is not so much that the great bulk of people do not reason, but that they reason stupidly. As Lund's study<sup>24</sup> demonstrated, emotions, hopes, and expectations distort cold intellectual processes.

It is this fact that makes the process of persuasion difficult for the author who would be both intellectually honest and convincing. On the one hand, he must be something of a scientist, careful in squaring his statements with the best available facts, and on the other hand he must be skillful in arousing the feelings that must accompany conviction. This applies not only to argumentative forms of communication but to the fiction writer as well. The latter must cut and shape his characters so they are the counterparts of people who appear real to the reader. He must observe carefully what people do, the way they feel, have an insight into their drives and goals, and he must also clothe these facts with words and plots that carry conviction. One of the author's students, interested in a literary career, confessed at the end of a course in elementary psychology that he had found more psychology in some modern novels than he had in the psychology course. The cold intellectual facts of human nature had carried less conviction for this student than had the emotionally colored descriptions by good novelists.

The readiness with which people accept clichés—trite phrases with vague meanings—is a weakness upon which the rabble-rousing propagandist preys. He swings elections, stirs people to lynching, convicts or gains freedom for the defendant, by means of emotionally toned words unsupported by facts or reliable figures. The speaker or writer concerned only with convincing his audience, regardless of the justice or truth of his cause, spins a not-too-thick web of confused illusions: crime "rears its ugly head;" fascism is a black, fire-spitting beast; labor is for some an untutored, grimy hand crushing the fruits of enterprise; for others, labor is the back-

bone of the country, striding forth with full energy and lofty intentions. The zeal of the propagandist leads him to personify abstractions and then dress them with picturesque descriptions suitable to his purpose. Crime, fascism, labor, business interests, dollar diplomacy, and a host of other names and phrases are abstractions, convenient labels for systems of action, attitudes of flesh-and-blood people, or merely vaguely defined yearnings that have neither heads nor tails to rear in ugly contemplation. As Hollingworth has said, "just as faith without works is vain, so also passion without knowledge is treacherous."<sup>25</sup>

From the standpoint of intellectual honesty, it is fortunate that the public is more conscious of propaganda than at any previous time in history. The long list of books and articles exposing propaganda devices since World War I has sensitized at least a portion of the population. Opinion studies by the author have suggested that college students are less "taken in" than the general public by current shibboleths relating to some international problems. Presumably college students are more familiar with exposés of propaganda and are thereby less susceptible to its influence. Moreover, many newspapers since the beginning of World War II have labeled some news stories "Official Propaganda" or called attention to censorship of all dispatches from abroad. Consequently, it is perhaps somewhat more difficult for the speaker or writer to convince his audience by the usual methods of appealing to emotions, particularly if there is any hint of propaganda surrounding his presentation.

Convincing the audience is a task calling for practiced skill. The techniques helpful in this task must now claim attention.

### *Use of Emotional vs. Logical Arguments*

The burden of the discussion just preceding can be very easily summarized by saying that emotions rather than intellectual considerations are usually more important in determining beliefs. This statement is backed by a number of studies, most recent of which is one reported by Menefee and Granneberg. These investigators presented to some college students logical arguments in favor of a United States foreign policy characterized by isolation. To another group of similar students, the same position was presented in terms

of emotional arguments. A like procedure was followed with two additional groups, except that the policy advocated was one of collective security. Before and after the arguments were presented attitudes with respect to America's foreign policy were measured. The results indicated very little change in attitude for those students who were subjected to the logical arguments, but, on the other hand, the students who had heard the emotional arguments shifted considerably in favor of the advocated policies.<sup>26</sup>

From what has been said previously and from studies of this sort, it becomes evident that the speaker or writer who desires to change opinions, mold attitudes, or produce convictions must employ emotional appeals, at least to supplement his logical arguments.

### *Use of Authorities and Specialists*

One can often persuade an audience by the use of quotations from an authority or specialist. This principle is employed in testimonial advertising. Probably the reason for ready acceptance of statements attributed to authorities lies in an early dependence upon parental dictates. Very early in life one comes to accept the principle that some people (at least his parents) are exceedingly wise and are capable of much influence. Early training in this regard finds support in later life where marked individual differences in wisdom, power, and prestige are observed. It is clear that the testimony of certain respected individuals is accepted with less scepticism than that of others.

Moreover, there is evidence to indicate that the "persuasive weight" of an authority is in part a function of his popularity. For instance, one group of Southern college students was presented with a list of opinions concerning socioeconomic questions and were asked to indicate their agreement or disagreement with the statements. Two weeks later the same opinions were again presented but each was coupled with the name of some prominent public person, such as Henry Ford, Harry Hopkins, Herbert Hoover, Benarr MacFadden, or President Roosevelt. When the two sets of returns were compared it became evident that the prestige value of some names tended to produce greater agreement with the expressed opinion, but other names induced the students to disagree with some statements they had formerly accepted. As one would

expect in a southern community, Roosevelt's name, when attached to a statement, increased the number of persons agreeing with the statement. Contrariwise, Herbert Hoover's name had the opposite effect.<sup>27</sup>

If one may generalize from this study and other less systematic observations, it seems clear that authorities known and accepted by one's audience are important agents that can be called upon to convince and persuade. It is, of course, necessary to know in advance something of the prejudices of the audience so as to select those experts who are held in esteem. For instance, it is unlikely that Roosevelt's name would have carried so much prestige value as Lurie's study indicated, had the study been conducted in a strong Republican district. In some areas the prestige values of Roosevelt and Hoover might be the reverse of those indicated by Lurie.

### *Use of Majority Opinion*

Intellectual persons who value the opinions of recognized experts are likely to find little comfort in the discovery that majority opinion carries greater persuasive weight than expert opinion on controversial questions. That is to say, if one has a choice between citing the opinions of several experts or giving the results of a public-opinion poll on issues such as foreign policy or economic practices, the latter type of appeal will prove more persuasive. The evidence for this generalization comes from at least two studies made on widely different populations and separated by a number of years.<sup>28</sup>

Marple, for example, submitted to three age groups a list of seventy-five statements such as:

The Federal Radio Commission should prohibit the use of the radio for advertising tobacco.

Military training in schools and colleges should be optional rather than compulsory.

The installment plan of buying has done more harm than good to the stability of American economic life.

The white race is mentally superior to all other races.

After the subjects had indicated their agreement or disagreement

with the statements, the list was resubmitted to part of the original group with the consensus of expert opinions indicated on each item. The remaining group also repeated their judgments but were shown the majority opinion on each item based on the initial returns. The results indicated that more people shifted their opinions to conform with the majority opinion than to conform with expert opinion. This preference for the majority opinion was found in all three groups, high school, seniors, college seniors, and adults, although as age increased there was a greater resistance to both kinds of prestige influences.

A procedure similar to that just described was used in another study dealing with religious attitudes. Here the majority opinion was no more potent as a determiner of the change in attitude than was expert (clergymen) opinion.<sup>29</sup> It may be that the difference in findings between this study and the previous ones is due to the uniqueness of the subject matter. The authors suggest that clergymen stand out more as experts in their field than do the leaders in politics and economics.

One may deplore the fact that most people are guided in their thinking about social, economic, educational, political, and ethical issues more by the majority opinions of nonspecialists than by the opinions of experts. In these fields the expert may be closer to the ultimate truth. But it does little good for the speaker or writer to lament such human deficiencies. Instead, the wise course is to adopt one's presentation to take advantage, if possible, of the easiest avenues to persuasion.

### *Use of Specific Information*

From the field of advertising comes some evidence that specific statistics carry more conviction than do general information of a rather indefinite sort. One advertiser had used for some time a line that read, "fifty-seven per cent above Government specifications." After the man's associates induced him to reduce the specificity of his claim by changing the line to, "more than fifty per cent above Government specifications," replies to the advertisements were cut in half.<sup>30</sup>

A very elaborate investigation involving the reactions of 1000 male students to 375 student speakers revealed the importance of

clear concise proof in changing opinions.<sup>31</sup> In every case the speakers were allowed to choose their own subjects, but were instructed to attempt to influence their auditors' opinions upon that subject. An audience poll of opinion was taken prior to, and following each speech. In addition, the speakers and their presentations were rated by student auditors on a long list of characteristics. An elaborate statistical factor analysis of the data revealed that the audience's general impression of the clarity and adequacy of subject matter and proof accounted for most of the known influence upon the shift of opinion and for over one-half of the known influence upon ratings of the speaker's effectiveness. The second most important factor, as revealed in this study, was the speaker's physical and vocal animation, enthusiasm, and force, accounting for about one-fourth of the influence on the auditor's rating of the speaker's effectiveness. Strangely enough, this second factor exerted almost no weight in shifting opinion concerning the issue discussed. Positive, clear evidence leads to conviction.

The importance of specific image-arousing words in holding attention has been previously mentioned. Producing conviction also calls for the use of concise, simple words whose meaning is specific. Contrast the following two sentences and note the difference in clarity of meaning.

In proportion as the manners' customs, and amusements of a nation are cruel and barbarous, the regulations of their penal code will be severe.

In proportion as men delight in battles, bullfights, and combats of gladiators, will they punish by hanging, burning, and the rack.<sup>32</sup>

Most people will agree that the second of these sentences is more clear and more convincing because of its use of concrete rather than abstract words.

### *Use of Existing Desires*

More than one sage has often observed that people believe only what they want to believe. This is, of course, an overstatement, but it does express a tendency which has some basis in experimental findings. Reference has been made in this and another chapter to the study reported by Lund on the relation between one's beliefs, desires, and information concerning the truth of certain proposi-

tions.<sup>33</sup> The reader will recall that Lund presented to his subjects a long list of statements, some of which were debatable and others factual. The statements were first rated on a scale of belief, that is, the extent to which the statements were believed by the subjects. Next, they were rated in terms of the extent to which the subjects desired or wished the statements were true. Finally, they were rated in terms of the amount of evidence known by the subjects to support each proposition. The results showed a strong tendency to believe statements because of a desire that they be true. Moreover, the influence of desire was greater than the influence of evidence. However, this does not mean that one's desire to believe that the sun revolves about the earth would completely negate the overwhelming body of evidence to the contrary. Where the evidence is quite obviously on one side of an issue, one's desire for the opposed side will not be an important determiner of final belief. At the same time, it is well to remember that on issues where evidence and desire are well balanced on opposed sides, the individual will most likely be guided by his desires rather than the evidence.

The speaker and writer can make use of this principle by appealing to the existing desires of the audience. The desire to maintain a democratic form of government in the United States may be tied to any number of proposed social reforms. On the other hand, one of the factors that enabled Hitler to gain control of Germany was his ability to picture his brand of fascism as a revolt against defeat. The German Republic had been forced on the German people after World War I and was easily identified with feelings of inferiority. Hitler's form of control was accepted by the majority partly because it represented a change that promised to relieve the oppressive feelings of national inferiority associated with the German democratic government. Hitler failed to provide evidence on the inferiority of democratic government but instead focused on the positive desire to build a great nation by throwing off the "democratic shackles of defeat."

### *Relative Weight of Spoken and Written Arguments*

Can one convince his audience more easily by speaking or writing? Do people place more confidence in one form of communication than the other? This problem is complicated by a number of factors



and at present has not been satisfactorily answered. As previously mentioned, a platform or even a radio speech differs from a written presentation in features other than the mode of communication. Voice quality, emphasis, and tempo have no counterparts in a written presentation. On the other hand, the freedom to reread sections is not duplicated in the public-address situation. In spite of these features which may contribute to the persuasiveness of writing or speaking, it is quite likely that in general more confidence is placed in printed than spoken arguments. People often say things they do not mean, but they have been trained to believe more implicitly in printed statements.

The only study bearing on the question at hand was one in which twelve sentences were presented both visually and orally to a group of subjects who were to judge whether the sentences were grammatically correct, awkward and displeasing, or correct in every way. After the results were tabulated it was evident that the subjects were more critical and more accurate in their judgments when they were reading than when listening.<sup>34</sup>

The author recalls a discussion he once had with an elderly woman on an issue which has since been forgotten. The woman maintained her position because, as she said, "It says that in a book downtown in the library." This woman, like a great many others, apparently felt that only books containing the truth were published!

#### 4. A PARTIAL SUMMARY

As a partial summary of the discussion of effective speaking and writing, it may be profitable to examine the outstanding differences between effective and ineffective student speakers as uncovered in Monroe's study of 1000 student ratings derived from 375 speakers. In the first column of the following table are the characteristics of good speakers, which are contrasted with those of the ineffective speakers listed in the second column.

For the most part, the following features listed are concise, clearly defined characteristics that may be used by the student to judge his own public-speaking behavior. These have the added value of being empirically determined and not the product of armchair speculation.

Table 23. Showing Items on Which Effective and Ineffective Speakers  
Were Significantly Different<sup>35</sup>

<i>Effective Speakers</i>	<i>Ineffective Speakers</i>
Used good proof	Points not clear
Made eye-to-eye contact	Monotonous voice
Used strong emphasis	Seemed insincere
Used samples	Appeared stiff
Seemed alert	Hazy development of ideas
Talked too fast	Awkward movement
Used good illustrative material	Lacked vividness
Showed enthusiasm	Looked at floor, ceiling, out of windows
Seemed poised	Nervous fidgeting
Speech was well organized	Showed little enthusiasm
Used good gestures	Gestures weak or indefinite
Pleasant voice quality	Voice weak
Gave statistical evidence	Lacked knowledge of subject
Motive appeal was strong	Dull; uninteresting
Summarized well	
Enough detailed information	
Clear wording of ideas	
Gained common ground with audience	
Was physically active	
Made strong positive statements	

## 5. SUMMARY AND CONCLUSIONS

This survey of effective speaking and writing from a psychological vantage point has remained close to laboratory studies bearing on the broad aspects of the problem. At the same time a real effort has been made to avoid technical reports with few applications for practice. Consider as an example of the latter type of material the following quotation from a study of representative works of two well-known English writers.

It follows also that Mr. Bernard Shaw, while undoubtedly under the impression that he was punctuating at his own free will, was for this particular book hide-bound within the limits of

$$Z = \frac{1}{0.29 \sqrt{(2\pi)}} \exp. \left\{ \frac{(1.4 - x)^2}{2(0.29)^2} \right\},$$

while, similarly, Mr. Wells was writing under the restricting influence of

$$Z = \frac{1}{0.24 \sqrt{(2\pi)}} \exp. \left\{ \frac{(1.3 - x)^2}{2(0.24)^2} \right\},$$

where  $Z$  is the frequency and  $x$  the logarithm of the number of words per sentence.<sup>36</sup>

Such wisdom as may be contained in these formulas has little direct application in the practical task of gaining attention, holding interest, and convincing one's audience. Unfortunately, information concerning the rudimentary techniques of effective speaking and writing is somewhat lacking. This condition is probably the result of a widespread belief that these skills are to a large extent "unteachable." They are more a practiced art than a precise science. However, there are experimental studies which enable one to judge with some accuracy the usefulness of certain procedures.

The discussion of writing and speaking effectively has treated three basic problems: first, the necessity and techniques for attracting attention; second, the reasons for, and ways of holding interest; third, the ways of persuading one's readers or listeners. The attention-getting techniques for writers are: an appeal to unfulfilled wishes; the use of questions; an appeal to interest in the new, the novel, and in startling claims; the inside-story and how-to-do-it approaches. Furthermore, a common feature of all of these devices is their ability to announce the principal point of the presentation at the start. Speakers have additional ways of attracting attention. The principal considerations here are: the chairman's introduction; the speakers' voice quality; and, finally, the use of mechanical devices or unusual acts.

Writers employ a number of techniques in holding the reader's attention once it is caught. Probably the most important consideration in this connection is the choice of image-arousing words and the use of a sentence length which does not tax the normal limits of sustained attention. Another feature contributing to good writing is its rhythm. Humor, if skillfully used, also helps to hold attention. Both oral and written presentations which propose to do more than entertain are well organized so they keep moving toward a climax and thereby hold attention. Speakers have a number of potential advantages over writers, since they can employ gestures, vocal emphasis, and numerous kinds of visual aids to hold attention. Moreover, the speaker can observe the effects of his speech as he goes along and modify it in minor respects as the mood of the audience changes.

Persuading either readers or listeners requires more than a direct logical discourse. However, intellectual honesty demands that the

presentation have a logical scientific basis even though it may be surrounded with emotionally toned words and appeals. Authoritative statements by experts on the issues involved are likely to aid in persuading one's audience, but such testimony is less effective than reports of majority opinion. Specific, as opposed to general, information is the more persuasive. The skillful propagandist achieves his aims and sways his audience partly because he links his proposition with existing desires. Finally, there is reason to suspect that written statements are accepted as being more truthful and consequently more convincing than spoken arguments.



# *Appendix*



## SIMPLE STATISTICS

From time to time within this textbook it has been necessary to employ statistical terms without explaining their meaning or without showing how certain statistical measures are obtained. It is the purpose of this appendix to give a brief, and necessarily an elementary, treatment of the simplest statistical concepts.

It may prove helpful to think of statistics as dealing essentially with only three kinds of measures: measures of central tendency or averages, measures of dispersion, and measures of correlation. Each will be considered, beginning with the measures of central tendency of which there are three.

### *Arithmetic Mean*

A large number of people believe there is only one way to arrive at the average of a group of measures; that is, one must add up the measures and divide by the number of cases. For example, suppose you have the following scores on a test taken by 40 people:

16	19	20	23	23	26	27	28	28	31
31	32	32	35	37	38	38	39	41	41
42	43	43	43	44	45	45	48	49	50
53	54	56	59	64	65	67	67	71	74

The sum of these scores is 1717 and dividing by the number of cases, 40, we obtain the value 42.9 as the average. Expressed as a formula this average, or more correctly, the arithmetic mean is as follows:

$$M = \frac{\Sigma X}{N},$$

where,  $M$  equals arithmetic mean,

$\Sigma X$  equals the sum of the scores (the capital Greek letter,  $\Sigma$  always means "sum of";  $X$  always stands for the individual measures),

$N$  equals the number of cases.



This, however, is only one average that can be obtained from this set of scores. Two other measures of central tendency are the mode and median.

### *Median*

The median is defined as the mid-score or mid-value in a distribution of measures. That is to say, if the scores are arranged in order from lowest to highest as they are in the above example and counted from either extreme until the middle value is found, that value will be the median. In the example above, no middle score is given since there is an even number of measures. We can take neither the twentieth score nor the twenty-first score as the median because in either instance one-half of the distribution would have one more measure than the other. Hence when there is an even number of cases it is necessary to find the mid-point between the middle pair of scores. In the example, the twentieth score is 41 and the twenty-first score is 42; hence the median is 41.5.

Notice that this differs only slightly from the arithmetic mean of 42.9 obtained previously. Both are measures of central tendency. If they are similar in value and meaning, what is the reason for bothering with two devices that indicate the same thing? A number of reasons can be enumerated. First, the median is less affected than the mean by the existence of extreme scores and may in some circumstances be more representative of the total group. Suppose we were to add to our above list of 40 scores an extreme value, 95. The sum of the scores would then be 1812 and the mean would be 44.2 compared with its previous value of 42.9. The median would increase, however, to only 42. In the process of finding the mean all the measures are used, and as the measures deviate further and further from the mean they exert greater and greater influence on it. A second practical consideration is the comparative ease with which the median is computed especially when the number of cases is small. Third, in a good many psychological studies we are interested in discovering where the average individual falls in a descriptive continuum such as aggressive-reticent, or introvert-extrovert. For convenience of treatment, ordinal numbers are often assigned to the extremes and to the intermediate descriptions between these extremes. Strictly speaking, these numbers have no value, but merely designate a position in a continuum just as C comes before D or Y follows X in the "alphabet continuum." Hence in these cases, as exemplified in the rating scales discussed under Employment Psychology, the median serves very well to indicate the central tendency.

### *Mode*

The mode is the easiest of all measures of central tendency to understand

and to compute. The mode is simply the measure or score that occurs most frequently. Looking back to our collection of scores it becomes evident that the mode here is 43. That score occurs more frequently than any other.

### *Short-cut Methods*

So far the treatment has dealt with *raw*, or ungrouped data. Whenever the number of cases is small the methods of computation just outlined serve quite well, but statistical labors increase tremendously when the number of cases runs up in the hundreds or thousands as it does in many psychological studies. For this reason, it becomes necessary to devise some short cuts or easier ways of arriving at the various statistics already mentioned and others that will be treated shortly.

The first step in this direction is to group scores in classes of convenient size. Going back to the first collection of test scores, this would mean that we would inspect the measures to determine first, the lowest and highest scores, and second, the size of the class interval\* such that we could obtain between 10 and 15 classes of scores within the total range of scores. A class interval of 5 starting with 15 as the lowest limit provides 12 classes between the lowest (16) and the highest (74) scores in our collection. Next, the number of scores falling within the limits of each class is tabulated. These numbers are referred to as "frequencies" ( $f$ ), since they indicate the frequency with which scores within the designated limits occur in the original collection. Reading the first row of the following table, columns 1 and 4 show that there are two scores in the original group

Table A

<i>Class Interval</i>	<i>Mid- point</i>	$x$	$f$	$fx$	
15—19	17	1	2	2	
20—24	22	2	3	6	
25—29	27	3	4	12	
30—34	32	4	4	16	$M_x = \frac{\Sigma fx}{N}$ in classes
35—39	37	5	5	25	
40—44	42	6	7	42	
45—49	47	7	4	28	$M_x = \frac{240}{40} = 6$
50—54	52	8	3	24	
55—59	57	9	2	18	$M = 42.0$
60—64	62	10	1	10	
65—69	67	11	3	33	
70—74	72	12	2	24	
			40	240	

\*A class interval is the number of score values between the lowest and highest limits of the class. The class interval for a given distribution is the same throughout the range of that distribution.

which fell between 15 and 19. So far as the table is concerned each of the scores between the limits of a given class is equal, and the value of each is best represented by the mid-point of the class. Hence in this process of grouping the four individuals who scored respectively 26, 27, 28, and 28 are treated as if they all received the score of 27.

The computations can be simplified still further if to each class a number is assigned as shown in the column headed  $x$ . These numbers serve two purposes; first, to identify the class, and second to serve as substitutes for the mid-point values in arriving at the arithmetic mean. Let us explain the second function more fully. In assigning the number 1 to the class with a mid-point at 17 and the number 2 to the class with a mid-point at 22, and so on, we are in effect saying that for the time being we will compress our range of mid-point scores now running from 17 to 72, to a range running from 1 to 12. Thus each unit increase in the  $x$  values will represent a 5-unit increase in the mid-point values. This is done merely to reduce the labor of computing with large numbers. In other words, the present example is set up so that 1 stands for 17; 2 stands for 22; 3 stands for 27; and so on.

Now, in order to find the arithmetic mean it is necessary to multiply the frequency in each class by the "substitute value" of that class. The more laborious method would have been to multiply the frequency by the mid-point value. But following the shorter method gives the column headed  $fx$ . Adding the  $f$  column gives  $N = 40$ , and adding the  $fx$  column gives  $\Sigma fx = 240$ . Dividing  $N$  into  $\Sigma fx$  gives 6.

Is the arithmetic mean 6? Not quite, if it is recalled that we were using substitute values to arrive at this number. That 6 means that the arithmetic mean is exactly at the mid-point of the sixth class, or 42. Comparing the arithmetic mean derived in this manner with the mean obtained using the raw, ungrouped data, only a slight difference will be noted. With a much larger mass of data the difference in the two methods would be even smaller.

Had the  $\Sigma fx$  turned out to be some value not evenly divisible by 40, it would have been necessary to carry our computations somewhat further. Assume that instead of the value 6, the value 6.32 had been obtained from the division of  $\Sigma fx$  by 40. In this case we would know that the mean should be something greater than the mid-point of the sixth class and something less than the midpoint of the seventh class. The interval between these two mid-points is 5. Consequently it is necessary merely to multiply .32 by 5 and add the value so obtained to the mid-point value of the sixth class. The arithmetic mean in this last instance would then be 43.6.

To compute the median using grouped scores the procedure is much the same as with ungrouped data. Referring back to the example, it is necessary to make a cumulative count in the frequency column until we reach the class in which the hypothetical 20.5 case falls, discovering that the middle case is somewhere in the 40-44 class. Since this class contains 7 cases and there are 15 cases up to, but not including the 40-44 class, it becomes clear that the 20.5th case is  $5\frac{5}{7}$  of the distance above the lower limit of that class. The distance included within the entire class is 5 units so the median is  $40 + (5.5/7)5$  or 43.9. Reduced to a formula the

$$\text{Median} = L + \left\{ \frac{\frac{N+1}{2} - F_l}{f_p} \right\} i,$$

where  $L$  equals the lower limit of the class containing the median,

$N$  equals the number of cases,

$F_l$  equals the sum of the frequencies below the class containing the median,

$f_p$  equals the frequency of the class in which the median lies,

$i$  equals the size of the class interval.

The mode still remains the easiest of all measures of central tendency to determine. In the grouped scores it is the mid-point of the class with the greatest frequency, or 42.

Summarizing, the measures of central tendency are three; the arithmetic mean, the median, the mode. They can be computed directly from the raw data or, when the number of cases is large, it is more convenient to group the data and arrive at the averages by short-cut methods.

## MEASURES OF DISPERSION

Measures of central tendency fail to reveal all of the characteristics of a group of data. The mean, median, or mode may give an indication of the most representative score but it is often desirable to know to what extent the scores deviate from the average. To illustrate this feature in a group of scores let us construct a distribution curve on the basis of the 40 scores as classed in Table A and compare it with another distribution (B) derived from a separate group of people taking the same test. In the following figure the classes are plotted along the base line, while the ordinate represents the frequency with which scores of a given class occur. The number of cases is the same in each distribution and the averages are nearly equal, but a glance at the figures shows a number of important differences. It is quite apparent that the total range of scores in the second is considerably less than in the first. The total range of scores, that is, the difference between the lowest and highest scores, may serve as a rough measure of spread, but its usefulness as such is decidedly limited.

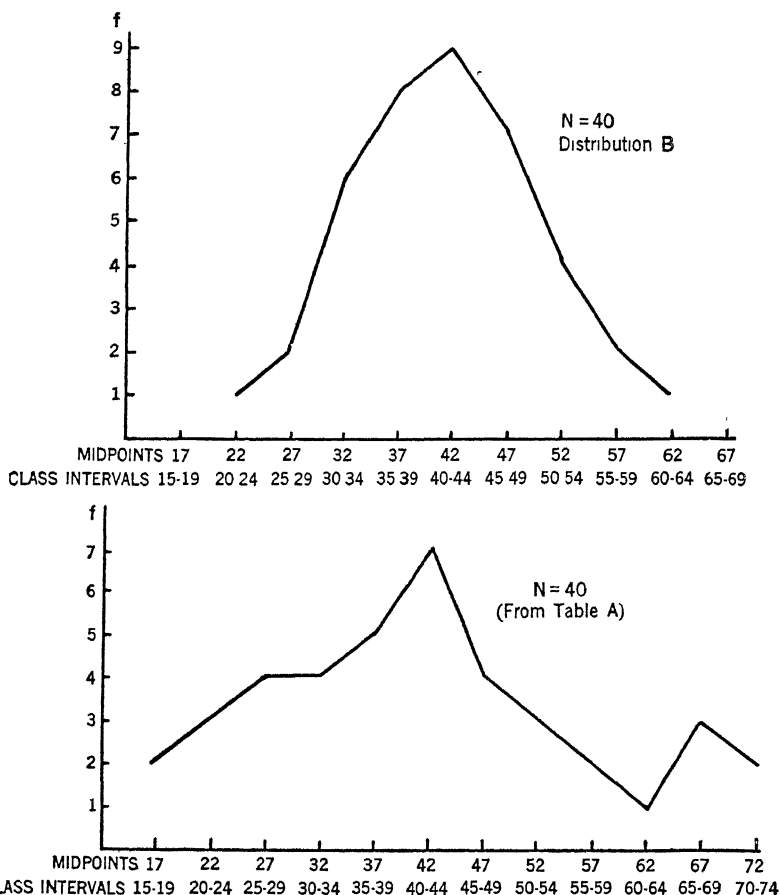


Figure 49. Showing Differences in Dispersion Between Two Distributions, Each Containing the Same Number of Cases.

### Mean Deviation

An easy-to-understand measure of dispersion is the mean deviation. The name of this statistic is almost its definition. The mean deviation is found by determining the amount by which each score deviates from the average of the distribution and then computing the arithmetic mean of these deviations. The deviations may be taken from any one of the averages although the mode is rarely used for this purpose. This process involves, so far as the first example is concerned, that each score below 42.0 be subtracted from that mean, and then subtract 42.0 from each score above the mean. It is necessary to add these deviations and divide by  $N$

to get the mean deviation. This is quite clearly a very simple, but time-consuming process, even when the number of cases is comparatively small. The work may be abbreviated by computing the deviations above the mean and dividing by  $\frac{1}{2}N$ , which, on the assumption that the deviations on one side of the mean are equal to those on the other, gives a value equal to the mean deviation.

The simplest formula for the mean deviation is:

$$A.D. = \frac{\Sigma(X_g - M) + \Sigma(M - X_l)}{N},$$

where  $A.D.$  equals average or mean deviation,

$X_g$  equals each value greater than the mean,

$X_l$  equals each value lower than the mean,

$N$  equals the number of cases.

### *Standard Deviation*

The most widely used measure of dispersion is the standard deviation. It is defined as the square root of the mean of the deviations squared. That is to say, once the deviations are determined as described in the previous section it then is necessary to square each of those deviations, take the sum of these squares, divide by  $N$ , and take the square root of the quotient. The formula to be used with raw data is:

$$S.D. = \sqrt{\frac{\Sigma D^2}{N}}.$$

Fortunately the work can be shortened considerably by merely following one step further the devices employed in obtaining the mean with grouped data explained previously. It will be recalled that  $x$  values were substituted for the mid-points of each class in order to make it possible to deal with smaller numbers. The standard deviation of the distribution can be obtained by merely squaring these  $x$  values, multiplying them by the  $f$  for each class, and substituting in the following formula:

$$S.D. = i \sqrt{\frac{\Sigma fx^2}{N} - Mx^2}$$

where  $S.D.$  equals standard deviation,

$\Sigma fx^2$  equals the sum of the products obtained from multiplying the  $x^2$  values by the frequencies in each class,

$N$  equals the number of cases,

$Mx$  equals the arithmetic mean, before conversion from substitute values,

$i$  equals the size of the class interval.

For the example given earlier the standard deviation can be computed as follows:

Table B

<i>Classes</i>	<i>Mid-point</i>	<i>x</i>	<i>x<sup>2</sup></i>	<i>f</i>	<i>fx</i> <sup>a</sup>
15—19	17	1	1	2	2
20—24	22	2	4	3	12
25—29	27	3	9	4	36
30—34	32	4	16	4	64
35—39	37	5	25	5	125
40—44	42	6	36	7	252
45—49	47	7	49	4	196
50—54	52	8	64	3	192
55—59	57	9	81	2	162
60—64	62	10	100	1	100
65—69	67	11	121	3	363
70—74	72	12	144	2	288
				40	1792

$$\begin{aligned}
 S.D. &= 5 \sqrt{\frac{1792}{40} - 36} \\
 &= 5 \sqrt{8.8} \\
 &= 14.9
 \end{aligned}$$

In a complete table in which both the standard deviation and the mean are computed it would be necessary to have in addition to the material given above only one other column, namely one headed  $fx$  as in the previous table given on page 543.

The standard deviation, in addition to indicating the spread of a distribution, provides the basis for computing sigma scores as described on page 166.

For the trained statistician it has a number of important connotations. First of all we can generally assume that with a large number of scores having approximately a "normal distribution" that all scores will fall within 3  $S.D.$  units on either side of the mean. Furthermore approximately 68 per cent of the cases will be within  $\pm 1 S.D.$  of the mean.

By way of summary, it is well to remember that the  $A.D.$  and the  $S.D.$  are only two of the more important statistics which indicate the spread of a distribution of measures. The  $S.D.$ , however, will be encountered much more frequently than any one of the others.

## CORRELATION

In a great many instances confronting psychologists, biologists, and social scientists it is helpful to know not only the average and the amount of dispersion in a distribution of scores, but it is also important to know how one set of measures is related to another, both sets coming from the same population of people. We may want to know how intelligence is related to age; or how economic level is related to emotional stability; or how performance on a test is related to skill in some job. To answer questions of this kind a number of correlation statistics have been de-

veloped. The correlation coefficient is merely a number between  $+1.00$  and  $-1.00$  which indicates the extent to which an increase or decrease in one measure is related to an increase or decrease in the other. A  $+1.00$  coefficient indicates that as one measure increases the other also increases in direct proportion. A  $-1.00$  coefficient indicates that as one measure increases the other decreases in direct proportion. A coefficient of  $0.00$  indicates that there is no relation whatsoever between the two measures. Correlation coefficients in the biological, psychological, and social sciences rarely exceed  $.90$  and many of them are of the order of  $.50$  either plus or minus. This fact is a reflection of the extreme complexity in these sciences where the factors influencing a given measure are obscure, difficult to identify, and often impossible to control. For purposes of explaining the meaning and to illustrate the computation of a correlation coefficient by only one of the several methods, let us consider the following example:

An employment manager wishes to know what relation exists between the scores obtained on a given employment test and the production of employees after they have had opportunity to learn and become adjusted to the job. He has adequate records on only 15 cases as follows:

Table C

<i>Employee</i>	<i>Test Score</i>	<i>Production</i>
A	47	109
B	73	114
C	62	125
D	50	127
E	49	130
F	79	132
G	65	132
H	68	136
I	70	138
J	67	142
K	74	145
L	69	146
M	77	148
N	75	150
O	71	156

Inspection of this table shows that Employee A has the lowest production record, O has the highest record, and the others have been arranged in order between these extremes. Examining the test scores shows that these do not fall in order as do the production records. However, the men with low production seem to have low test scores, and the men with high production generally have high scores, but just how close is the relationship? The rank-difference correlation coefficient can be used



in such a case to give the answer. As the name implies, this statistic depends upon the ranks given each man on each of the two variables. In the table below it can be seen that employee A was lowest in production and lowest in test score. Consequently, he was given the rank of one in each of the "Rank" columns, the difference in ranks (entered in the next column) being zero. K, to take another example, stood twelfth from the

Table D

<i>Employee</i>	<i>Test Score</i>	<i>Production</i>	<i>Test Score Rank</i>	<i>Production Rank</i>	<i>Diff.</i>	<i>(Diff.)<sup>2</sup></i>
A	47	109	1	1	0	0
B	73	114	11	2	9	81
C	62	125	4	3	1	1
D	50	127	3	4	1	1
E	49	130	2	5	3	9
F	79	132	15	6.5	8.5	72.25
G	65	132	5	6.5	1.5	2.25
H	68	136	7	8	1	1
I	70	138	9	9	0	0
J	67	142	6	10	4	16
K	74	145	12	11	1	1
L	69	146	8	12	4	16
M	77	148	14	13	1	1
N	75	150	13	14	1	1
O	71	156	10	15	5	25

---

 227.50

$$\rho = 1 - \frac{6\Sigma(\text{Diff.})^2}{N(N^2-1)} \quad \rho = 1 - \frac{6(227.5)}{15(225-1)} = 1 - .406$$

$$= .594$$

bottom in test score and eleventh in production, the difference being 1. Occasionally two or more people tie for a given rank, as in the case of production ranks to be assigned to F and G. In such cases it is necessary to determine what ranks would have been assigned had the measures been unequal but in successive ranks. In the example, either G or F would have received the rank of 6 and the other, the rank of 7. But since they are tied it is only reasonable to give both the same rank, which is the average of the "would-have-been-assigned" ranks or 6.5.

The differences in ranks are squared as shown in the last column. Adding the (Diff.)<sup>2</sup> column gives us  $\Sigma (\text{Diff.})^2$ . The formula for  $\rho$  or the rank-difference correlation coefficient, is given just below the table. Substituting in this formula we find that the coefficient of correlation for the example is .594.

THIS method of computing the correlation coefficient is reasonably satisfactory as long as the number of cases does not exceed thirty. Beyond that it is general practice to use the Pearson  $r$  method. Probably most of the correlation coefficients encountered in psychological research literature are Pearson  $r$ 's.

The computation of this statistic, however, is beyond the scope of this appendix although the method is adequately described in practically all statistical texts. The interpretation of the Pearson  $r$  and the rank-difference coefficients is for most practical purposes the same.

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